

Pacific Project - Journal

June 11, 1964

Wash DC. AM - Honolulu - PM.

The trip to Honolulu was eventful, & now at 10:00 PM - (4:00 AM June 12, Wash time) I will try to piece together the fragments of the day. After a peculiar last minute parking, we left Smithsonian via cab, to bus terminal - left Baltimore on schedule for Chicago & points west. On the trip to Chicago - young lady throws me a package of peculiar dimensions, & after a brief game of 20 questions I decide it is a wooden duck - which it was.

From Chicago to L.A. was interesting, the trip over the Rockies most fascinating. We flew over Grand Canyon, & the pilot obligingly banked the plane so we could get a full view of the scene - fantastic views overall. In L.A. the stewardesses did a quick change job, changing from typical costumes into stealthy Hawaiian gowns. To the tunes of Hawaiian music we flew from L.A. to the islands. Approach to the islands great 1st sight to vision to the South as such setting. Then Maui, Molokai, Lanai appeared. Finally Oahu & down. Unbelievable frenzy of people at airport met by Mrs. Elz who finally turned

receptor



June 4 - cont.

ies (Dale Hurst & I) over to the capable  
hands of Bob Fleet. We still haven't  
summed this. Sack at 4200 - to  
offshore islands for work tomorrow.



Popoia

18 June 1964

Fri.

Awakened at 0600 by a persistent calling that wouldn't stop. Turned out to be Banded Doves. Also the noisy chatter of the Mynas contingent was a conspicuous dawn calling.

Went to Tantalus before our trip to Popoia Island. There we found the Deciduous, Rice Bird, Elepaio, & White-eye. All were common excepting the Elepaio, which was somewhat restricted to the higher elevations. Tantalus affords an excellent view of Diamond Head & Waikiki on one hand, & Pearl Harbor on the other. Back after little over one hour to visit & band on offshore islands.

Wedge-tailed Shearwater

Picked up gear at Dr. Ely's house & went off to Popoia. The island is small & low, no point reaching more than 8' above high tide. It is separated from mainland by about 300 yds of shallow water. As we approached ( $\approx 1700$ ) we could see 2 Wedge-tailed Shearwaters banking over the island. The birds were not at all numerous, & there were never more than 5 or 6 in air at one time until it was quite dark. Warren mentions that last month at this time they were much more numerous, perhaps 10-15 times as many, as now. However, courtship was then in progress, whereas now most nests (9 out of 10 checked) contained 1 egg.

Bulwer's Petrel

After dark the Bulwer's Petrels began calling from



① Barred Doves

② Mynah

③ Lerothrix

④ Rice bird

⑤ Elepno

⑥ White-eye

⑦ Wedgetailed Shearwater

⑧ Bulwer's Petrel

?



12 June 64 con.

within their burrows, a dog like call that, when uttered, increases, facilitating location of the burrow. We hunt out these well-concealed birds, banding 15 of them. We also manage to band 25 of the very flighty Wedge-tails.

Popoia is very flat, a shelf of extremely porous coral, covered with

the holes are, ~~also~~ actually, series - dense like, ramifying throughout the island, & lined with stiff coral projections into the openings. A better island for Procellariids couldn't be devised, at least from the standpoint of its porosity.

Were the 1<sup>st</sup> Procellariids nesters in cavities like these? Did burrow digging evolve from this earlier habitation of natural burrows?

Many dead birds were in evidence, perhaps because of some disease - ~~some~~ some probably due to human interference. Women noted earlier birds on their backs & quivering, probably from some disease.



5

MANANA Isl.

13 June 1964 - Sat.

Today brought the further acquaintance of some more of Darwin's birds, as well as the foundations for work tomorrow.

Originally we had planned a trip to the offshore island - Moku Manu, but we could not get accommodations by boat in time for the trip. As a consequence, we left at about 1430 from Kaupā Beach for Manana (Rabbit) Island.

We had an hour's wait for the boat, so - off to Sand Beach (Waimanalo) for a quick dip. The surf was heavy ( $\approx 5'$  shore break) + managed to toss us up a bit. We got back to boat, saw Brazilian Cardinals feeding 2 young - the young have brown heads, & left for Manana, finding easily the rather broad opening through the reef.

Paroaria cristata

Manana - 4 breeding birds

1. Sooty Terns -  $\approx 100,000$  - young well advanced, most will be flying within a week.
2. Noddy Terns - Warren estimates 25,000, most have started breeding, eggs & small young in evidence - some with large young. The most advanced Noddies (Anous stolidus) have young ~~some~~ older than the latest Sooties, whose young are still small. The Noddies mostly surround the legs of the



⑨ Brazilian Crested Cardinal

⑩ Sooty Terns

⑪ Common Noddies

⑫ Greater Frigatebird

⑬ Red-footed Booby

?



6.

13 June 1964 (Cont.)

MANANA

old crater, whereas the Sooty Terns are around the island below this level.

3. Wedge-tailed Shearwater - Crater bottom filled, Warren estimates 25,000 pr. Most now have eggs - 1 egg laid on bare ground - no adult near.

4. Bulwer's Petrel - 4 or 5 found, located by calling from burrow - with eggs. The throat is puffed out before the call is produced. All black petrel.

Flying over - saw few Red-footed Boobies - (white tail) in area.

Over Kapa \_\_\_\_\_ 5 Fregata minor were seen soaring.

Noddy young

?

One curious Noddy characteristic - there appears to be a polymorphism in the chicks, they being either pearly grey or solid brownish. I will try to estimate ratios today, but apparently it is 1:1. Selective advantages? Genetics of this?



14. Wandering Tattler



7

14 June 1964

MANANA Is. - Oahu

SUN.

Left Kaupā 0900 for Manana, stayed until 1700 banding Sooty Tern young - King, Husted, Ely & I banded 1900 birds. At one pt. we saw a Noddy (Common) with an Orange Steamer - a Johnston Island bird. This is the 1st record of any Johnston bird turning up on the offshore islands.

Some of the young Sooty's are almost flying - seeing them down was difficult.

? Anous stolidus - Common sight - 2 birds flying together over the island again & again. What is function - a courtship flight? Most Noddies now have eggs or very small young.

Also seen today - Wandering Tattler (1)

Frigates over KAUPA

Red-footed boobies in channel between Rabbit & Oahu.



8

15 June 1964

Mon.

No trips today. However, I have heard that Fairy Terns are to be found on Coco Head. Perhaps I shall try to find them!

Newells' Shearwaters must nest somewhere on Oahu. We are to be looked for in the Waianae Range - perhaps ~~some~~ rope work necessary. They have been found in Honolulu streets.

Attracted by the lights? Women spent one night looking for them without success.

Sula sula

On Mokapu Pt, 2 years ago there was 1 dark phase Sula sula. Last year there were 10. They are very dark birds, still have white tail & red feet. ~~As~~ As you go south (Kauai) to Five & Phoenix Islands, the proportion of dark phase birds increases tremendously. What is the function of this change in frequency? The same

Wedge-tailed Shearwater

is true for the Wedge-tailed Shearwater.



9

16 June 1964

Tue

KULIOUOU SWAMP  
 KUAPA POND  
 COCO HEAD

1045 KULIOUOU Swamp - Highly tidal, mangrove  
 swamp (not dense), mostly open mud flats.

Tide out, much mud exposure.

Black-necked Stilt - 50.

Golden Plover - 10 (2 in mottled breeding plumage)

Wandering Tattler - 2

1120 KUAPA Pond - Very desolate, prob. due to  
 construction all about. Saw only Black-crowned  
 Night Herons - 6.

1215 - 1500 ~~to~~ COCO HEAD - Stopped all over  
 the bloody crater, through the mangroves (?) in  
 craters over cliffs & about. Saw no Fairy  
 Terns, which was object of search. Managed  
 to get 2 or 3 wasp stings in back of neck  
 for my troubles. 6 Fairy Terns were seen in  
 crater by Mike Ord & Warren King earlier this  
 month.

In area - Mockingbird (2), Barnard Dove,  
 Chinese Spotted Dove, Tortoisep, Myioph,  
Brazilian Cardinals, & Passer domesticus, gambel.



15. Black-necked stilt

16. Golden Plover

17. Black-crowned Night Heron

18. Mockingbird

19. Chinese-spotted Dove

20. English Sparrow



17 June 1964

Wed.

## Bishop Museum

Spent the day in Bishop Museum looking up info.  
on the Gilberts & Marshalls. \$

In Museum grounds there was an albinistic  
English Sparrow - the outer 2 or 3 rectrices were  
pure white. Various people have mentioned that  
albinism seems more common here than in other  
areas.

15. English Sparrow

16. English Sparrow

17. English Sparrow

18. English Sparrow

19. English Sparrow

20. English Sparrow



11.

18 June 1964

Thurs.

Oahu -

MOKUAUUA ISLAND

Left car about 1830 + walked  $\frac{1}{4}$  mile up beach to Kalaniana Pt. All our gear was in a waterproof (almost) plastic bag. The island lies only about 400' offshore, + is easily waded to. A current from E to W. washes through the channel, waves were light. In heavy surf this may be of importance.

No birds were in the air when we arrived at island (1900). No Shearwaters appeared over land before dark, and only 2 or 3 did before we left. Nests at N. end of island (Wedge-tailed Shearwaters) hard to find, + birds handled tend to readily abandon area. Near Oahu (S.W. end of island) there is more soil, + the Wedge-tail burrow long (2' - 4') burrows in this. They can be handled + stuffed back into burrows, + will not abandon the egg. Burrows are not dense, scattered over the island, many in open or under trees - most seemed on lee side of tree, rock, or bush.

Birds Banded: 615-15626-32 (17 birds)

Birds handled, with bands: 544-45408

" - 45416

" - 45478

615-03961

" - 07703

" - 15---

Of 13 birds in hand, 6 were banded previously.  
We can use recapture data to estimate island population



12

18 June 1964 (cont.)

in hand

$$\frac{\# \text{ not banded}}{\# \text{ banded}} = \frac{\text{total}}{\text{total banded}}$$

$$\frac{7}{6} = \frac{4}{1}$$

No shorebirds, no rats.

All birds were in burrows except one, which was sitting outside burrow occupied by bird with egg.

~~4~~ 5 other birds were checked to see if they had eggs. Of the 18 birds checked in burrow, 14 were on eggs.



13

19 June 1964

Fri

NW. Coast to sunny offshore islands AM

Took a good look at islands along NW coast.  
 Many unvisited islands look approachable. Perhaps the  
 2 rocks off Mokuauia have ledge-lairs.

P.M. - Dr. Elz's house - skinning!  
 sooty Tern. Coots, Gallinules -

20 June 1964

Sat.

AM. - Met Shearwater 0620 with Dr. Elz &  
 Pat Gould.

PM - Afternoon off. Went to Tantalus, where  
 managed to find my 1<sup>st</sup> Drepanid - the  
 Apapone. Fantastic country in that trail area.



(21) Архангел

see 50, 51

(21) Архангел



21 June 1964

Sunday

14.

MOKU MANU!

Undoubtedly the gem of Oahu, the heart of the island itself. What a fantastic area. We left Kaneohe Bay 1800, & made the 7 mi. trip, encountering very heavy swells & whitecaps once past the reef. Must have been 8'-10', highly irregular swells. At island, lee side landing area was relatively calm. Water drops to over 100' sheer. We ran ashore with material in waterproof rubber bag. No leakage. We used face masks to see what we were doing - a real aid, as one can see where to place feet as the swell rushes in. A hundred feet below, huge fish eye us as we approach. Landing easy in spite of swell on open sea - good to remember.

Species breakdown:

1) Wedgetailed Shearwater - #'s very difficult to estimate, birds in burrows all over island, prob. 2,000 pairs  $\pm 100\%$ . Many birds directly under red-footed booby nests. Most (90%+) were incubating fresh eggs.

2) Kauai Island Shearwater  $20 \pm 10$  pair  
Restricted to rubble at top pt on west end of island. Young large but with no contour feather development as yet.



- (22) Christmas Island Shearwater  
(23) Blue-faced Booby  
(24) Brown Booby  
(25) Gray-backed Tern  
(26) Hawaiian Noddy



Moku Manu (cont.) 21 June

15.

3) Bulwer's Petrel

Saw 1 only.

Perched on egg, deep within burrow  $\approx$   
6' back in cliff side.

4) Blue-faced Booby

1 pair

Incubating  $\approx$  2 eggs, ~~at~~ western end of  
island.  $\sigma^7$  scared away from area, &  
cont. to incubate the 2 eggs.

5) Brown Booby

150  $\pm$  50 nests

Few eggs, mostly with young that  
have well developed ~~eggs~~ primaries & contours

6) Red-footed Booby

400  $\pm$  100 nests

Most with young, primaries & scapulars  
arising. Few on eggs or naked young. One  
egg in process of hatching as we arrived  
on nest.

7) Great Frigatebird

400  $\pm$  50

No nests, perched all about sides of island.  
At our approach they moved to W end of 2<sup>nd</sup>  
piece of island, perched there. Strange ratio -  
by several sample counts - 90%  $\sigma^7$  to  
10%  $\text{ff} + \text{imm}$ .

8) Wandering Tattler

1 on E beach area.



Moku Mana (cont 3)

21 June

11.

9) Gray-backed Tern

$20 \pm 5$

1 local young seen, flew around area.  
Are located on S. coast area near tide line.

10) Sooty Tern

$15,000 \pm 5,000$

Everywhere on island, most young highly visible  
or flying. In ~~the~~ ~~near~~ approach, many flying  
young seen over ~~the~~ sea. Two lines from boat  
attracted numerous young, few adult birds.

11) Noddy Tern

$3,000 \pm 2,000$

Most on eggs - seaward side, higher prop. of  
young on top. Small young. Flying young  
were also seen.

12) Hawaiian Noddy

$300 \pm 200$

Mostly fledged young, many nesting in &  
around cave, N side of island.

1 large Turtle (sp.?), about  $3\frac{1}{2}' - 4'$  long,  
swimming off N. side

To & from island - 3 large (greater than 5')  
sharks seen. Apparently hang around ~~around~~  
island



17.

22 June 1964

Mon.

Pearl Harbor, Hickam Field, Dr. Ely's.

Red Tape AM - getting tickets for Midway flight, etc., PM - paper work & bird skins.

23 June 1964

Tue.

Hickam AM - Orders for Midway flight.

POPOIA - 1700-2130.

With A. merman, Miller, Woodward.

- Together we:
- 1) banded 65 Wedgetails
  - 2) " 9 Bulwer's
  - 3) collected 13 blood samples for U.S.

The method for collecting blood involves heart puncture. None of the birds died. On Wedgetails, heart lies up against sternum + 2" or so up under breast. Long needle required. When heart position is learned, blood samples may be easily taken.

3 recoveries (1 dark phase)

24 June 1964

Wed

Mokolii Island (Chinaman's Hat)

Were stood up AM for Trip to Moku Manu. Ruffed to island  $\approx$  noon, what a scruffy area. Banded 25 birds, Wedgetails, saw 3 exquisite birds - White-tailed Tropic Birds - my nomination for the loveliest sea bird. Perhaps 150  $\pm$  50 Wedgetail nests on island.



(27) White-tailed Tropic-bird

*[Faint, mostly illegible handwritten notes follow, likely describing bird specimens or field observations.]*



25 June 1964

In town, photo, check out,  
 (27) red tape, For record & 2nd copy -  
 expenses to date:

$$\begin{array}{r} 23 \\ 2474.50 \end{array}$$

11.30 (Trans. chg. fee)

1.00 Cab

2.50 Bus

58.76 } Car rental - Waverly +

50.00 } My deposit

.25 Parking

15.32 - CCL4

.57 3 in 1 oil

71.06 - Car rental

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 685.26
26 June 1964

Honolulu - MIDWAY

Got to MATS at 0800, flight took off at  
 0940. We had excellent views of Kauai,  
 Niihau, Pearl & Hermes Reef, and Midway atoll as  
 we flew up. Off Niihau there is a beautiful  
 crescentic island that may be a good bird island.  
 Pearl & Hermes looked as though there was little or  
 no above land portion, although we couldn't see  
 every bit of the reef. These atolls are unbelievable in their  
 structure & their colors. I would certainly like to be  
 able to do some diving in one of them.

Flying by Midway, we could see great #1's



(28) Red-tailed Tropic bird

(29) Laysan Albatross

(30) Black-footed Albatross

(31) Fairy Tern

32. Ruddy Turnstone

33. Feral Pigeon



26 June 1964

19

of Laysan Albatross flying toward the island like spokes of a wheel. Also, most conspicuous of all, were the 1,000's of Red-tailed Tropicbirds that were coming over the island. I have seen pictures read papers & talked to people, but I was totally unprepared for the sight of the boobies everywhere.

On laws, peoples patches, in the road (they have the right of way) - thousands of them. Most young are about ready to fly - approaching the pt. of experimenting with their wings. The air is filled with the cries & flights of Fairy Terns & Hawaiian Noddies, with the Tropic-birds higher above the trees. Midway still is very much a bird colony.

LAYSAN ALBATROSS - most young near to fledging, some getting off the ground, down restricted on most birds to neck & head.

BLACK-FOOTED ALBATROSS - have seen only about 10 birds, seem more advanced than the LAYSAN. Perhaps many young have left. None in the main base area, those seen were in open areas near Runway.

RED-TAILED TROPIC BIRD - seem restricted to patches of brushy areas away from densely populated spots, where they are numerous, nesting within 5' - 10' of one another. Most with soiled (advanced) egg or small downy young. Two young with contour feathers.



26 June cont.

20.

Hawaiian Noddy - In colonies (1 by BOQ) in Casuarina trees. Most are on nests, I cannot as yet tell their breeding status.

Fairy Tern - Spread over colonies, most birds not breeding. 2 young + 1 with egg seen, 1 bird flying with food. Height of breeding season over? or beginning? At least 2-3,000 birds.

Sooty Terns - None seen on Sand, flying over island & all around - immense #'s on Eastern.

Golden Plover -  $50 \pm 10$  birds seen on E end, S. portion of harbor.

Ruddy Turnstone -  $40 \pm 10$  birds, same area. 4 more seen flying on W end.

Wandering Tattler - 2, with Plover & Turnstones.

Feral Pigeon - Painted #'s, mostly white birds scattered sparsely over island.

Sea Turtle - 2 seen, inner harbor - small ( $\approx 2'$ )

Monk Seal - 3, 2 on or near island near channel mouth, 1 swimming just N of harbor.



27 June 1964

Sun. 21

Eastern Island - Midway A.

Left Sand 0730 on landing craft for Eastern. Saw island, then started working. The entire island is a bird colony, with large # of species. The airstrips (abandoned) are almost vacant, no birds utilizing them. Open country with scattered low shrubs harbors Sooty Terns, Albatross. With more brush in <sup>(Scaevola)</sup>, we find Red-footed Boobies, Frigate, Tropic-birds, & Wedgetails in addition to Albatross. An absolutely fantastic scene.

B LAYSAN ALBATROSS - same status as on Sand, Many young trying to fly. We collected blood samples from 50 adults with 1 fatality. Adults few & far between, mainly coming in to feed young before flying off again. Stomach contents of one included both fish & squid. Many dead on road, band recovered.

Black-footed Albatross - No adults seen. Young scattered & generally around edge of island. Most all were trying to fly, & were banded. The bulk of the pop - has prob. left island.

Wedgetailed Shearwater - Abundant in burrows under Scaevola & other thick vegetation. Found under most pieces of corrugated metal roofing. Blood collected from 50 birds, 1 died, specimen #. None seen flying over island. Almost all incubating, 1 ♀ with



with egg in oviduct. On mounds, most on S. side, fewer on N side.

Puffinus nativitatis(?) - One bird seen briefly in flight thought to be this species.

Frigate-bird -  $30 \pm 10$  seen roosting in casuarina trees, no nests seen. 1 attack on Booby seen. God, what rough play!

Red-footed Booby - Several hundred nests in Scaevola. Most young are large & getting primaries, some naked young seen. Called "Blue-Bills" & "Wags".

Masked Booby - Saw 1 pr., apparently 4 pairs on island. Did not see egg or young, but birds were close to nest site. Will check on Mon. (Called Silver-bill)

Red-tailed Tropic Bird - Nesting abundantly under bush wherever it is available. Most with well-incubated eggs or small young - downy.

Common Noddy -  $50 \pm 20$  birds in area we were working, S of runway just W. of Communication Towers. Have seen No Hawaiian Noddies on Eastern, no Common Noddies on Sand.



27 June 1964

23

Fairy Tern - very few noted on Eastern.

On Sand, large #s flying - wheeling about, continual harsh, guttural chatter. Many pairs flying about. 1 young with only traces of dam on head seen at Barber Boat Pool.

Sooty Tern - Thousands upon thousands on Eastern. At least 3 separate colonies, 1 the size of the Manana colony. 100,000 birds in it? With eggs & small young.

Gray-backed Tern - 1 seen, diving & scolding as though it had a nest. It had been flushed up from ground, but no young <sup>or eggs</sup> seen.

Lea Turtles - several between sand & Eastern

Mink Seal - one on sand spit between islands

Rat - one seen, Eastern.



28 June 1964

24

Sand Isl - Midway

Checked out Terns + Tropic birds.

Most young Terns have chicks, few eggs,  
+ much noisy flight. If disturbed,  
will mob person (but see Downard, 1965).  
Many young on roofs.

Anous minutus - most with young,  
many with primaries & certainly some there  
nesting in extensive colonies in Casuarina.

1400 - 1620 - Kure Island - Had only about  
1 hour on Island, had brief glance around  
with Geo. Wislocki as guide. This is certainly  
a perfect island for work - all three bookies -  
accessible, easily banded & studied, also  
private. Other breeding birds included Sooty  
Tern, Fairy Tern (few) + some Common  
Noddies, many Wedge-tail + Laysan Is.  
shearwaters. Almost entirely covered with  
Scaevola, many ledges. I hope I can get  
to this spot for work. Saw 8 Monk Seals  
on Sand just as we were landing,  
several others on Kure proper.

Many Masked Boobies, NESTING IN  
CENTER OF ISLAND, not edges as  
do most birds of this species on other  
islands.



28 June 1964 (cont.)

25

Back on SAND ISLAND, MIDWAY A.

# \_\_\_\_\_  
P.M. - after dinner we bled 25 ~~5~~  
Red-tailed Tropic Birds. 1 fatality  
from the cramping. Did you know - the  
young of this species are dimorphic  
also - some young are white, some  
are BROWN! What gives with  
theseセント. Noddies are the  
same way.

Color Phases - no dark phased  
Wedgetails seen here - small % on  
Oahu offshore Islands, more yet in  
Whorung + Line Islands. Rare atoy on  
dark phase in Red-footed Boobies.  
All 56 Wedgetails banded were normal  
color phase.



29 June 1964

Eastern Is. Midway  
26.

Blood Samples: 20 Red-tailed Tropicbirds  
8 Red-footed Boobies  
13 Laysan - Imm.  
1 Wounded Sooty Tern

Died: 2 imm. Laysan Albatross  
1 Sooty Tern

All species as before, except:

1. Common Noddy - 3 nests found,  
each with 1 egg. Some mixed  
Pop. =  $150 \pm 50\%$  in with Gray-backed Tern

2. Gray-backed Tern - found small  
colony, est. 50 nests in all.  
Nest is only bare space, generally  
near or under cover - extremely  
cryptic. Birds much more flighty  
than Sooty Terns. 3 nests  
found, 2 with eggs, 1 with  
1-2 day old chick.  
Pop. =  $100 \pm 10\%$

3. Sooty Terns - Most on eggs, 1 young  
found hatching, 2 downy chicks  
less than 3 days old seen.

Pop - Prob. 200,000



30 June 1964

21.

Midway → Honolulu via Prop plane.

As on arriving, the most obvious aspect of the island as one leaves are the birds - White Iguanas around the fields of the runway, Red-tailed Tropic birds abound. It is sad to leave this island with its great bird populations. The navy does a fair job in keeping the men from destroying the defenses which they invariably would be left to their own devices. One sailor got drunk, went on a rampage & killed some 20 or 30 goons. For his indiscretion he received 90 days in the Brig, a transfer from Midway, & who knows what else. It is sad to think, however, that only through such rigid discipline can the birds survive, the sailors apparently lacking any instinct to admire & respect these birds. There is one unprotected species - the "moaning bird" - Wedgetail - that is not protected, with the predictable result that it has been killed off to the point of near extinction on Sand Island. The Eastern Island pop. is OK, perhaps because of its distance from the bulk of the men.



1 July, 1964      h. Honolulu → sea.

This day is one of anxiety, optimism, & wonder as we leave Honolulu behind & steam into the immense space of the Pacific. I hope all goes well. The rocking of the ship begins early, but no problem as yet.

2 July 1964 → 19 July 1964

I write this in a lump because that is how it remains in my mind, a lump in stomach as well. To say that seasickness is miserable is like saying Everest is high - an entirely inadequate description of an obvious truth. God, what strange quibblings of the stomach, what rotten metallic tastes in the mouth, doubts about eating, spitting before the eyes, & a vomit that never rests still. For 5 days the situation remains unchanged, & the clanking of plates & silverware below only add a burden to the more sufferings above. I should & try to force down more food ultimately destined for the sea, or the side of the ship. Finally a solution, if I purge my stomach immediately before eating, I have 20 minutes or so of blessed calm & relief before the gnawing sensitivity returns to the stomach & chokes the throat.



(34) Bonin Island Petrel

(35) White-necked Petrel

(36) Dark-rumped Petrel (?) several, King Id from Johnston

see #49

(37) White-necked

(38) Dark-rumped



20 minutes - time enough to gobble down food & resume a prone position - one which allows fair chance of keeping the food down long enough for some digestion to take place.

Afraid of dying, ~~after~~ afraid later if not - that now makes eminent sense. Never had the ocean seem so big, nor land & the future so remote, as minutes resolved themselves into hours & days, & time moved quickly only with sleep.

There were good days, before the Promamine became ineffective, & then a few before the ~~it~~ male <sup>rooper</sup> pills failed to take effect. I could quickly get used to the pills, but not the motion, some delicate mechanism somewhere in the inner recesses of the ear failed to realize that rolling is a reasonable way of life, & so sent message to various areas ordering reactions which the mind could fight only in vain. The body & the mind in conflict, the reason unable to halt the blind & futile processes of a stupid body, never had the two elements been so clearly separated, never had the battle been so clearly declared, & never had rational thought been so stubbornly overpowered by the more material forces of the strangely insistent body.



On the end on acceptance of the futility of the battle made the voyage easier & I could settle down to a routine, which did not, however, allow of skimming, but of writing, or even of reading unless lying prone. Whenever sleep was possible - that greatest of all escapes - it was sought, & relinquished only with sorrow.

Many birds were sighted, and their names follow: Shearwaters: <sup>Nesbitt's</sup> Wedgetail, Xmas Island  
 Petrels: Bonin Island, White-necked, Bulwer's, & probably Dark-rumped (white linings sup).  
 Tropic birds - Red-tailed, White-tailed.  
 Boobies: Brown, Red-footed  
 Frigates: Greater  
 Terns: Sooty, Common Noddy, Gray-backed, Fairy

Several whales, 1 shark (with 2 pilot fish) & ~~3~~ 3 remora.

All in all, this area of the Pacific is a real desert in the sea, with birds widely scattered, fish scarce. Flying fish were seen commonly, larger near land. Feeding flocks are interesting & stratified, the larger Frigates high above, Petrels & Shearwaters near surface, & Terns in the middle, all bounding down when the prey is sighted. Squid taken usually, & in daytime.



19 July 1964 - 22 July 1964

At 1630 - blessed relief - Terra firma  
what bliss to stand again upon ground. A day off  
& the zoo is seen (Mon). Tue (21) - Wed we  
spend time putting up skins at Dr. Ely's.

23 July 1964

Kaohi Kaipu (Black) Island.

The 1<sup>st</sup> S.I. visit to this island was  
interesting & productive. We almost lost John  
& A merman as they clambered upon the wrong  
part of the island over rocks, fighting the surf.  
One must run to shore - there is no  
other way. Raft must be anchored in water  
± 10' deep to avoid breakers. Anchor should  
be secured by hand (∴ during march). Beware  
poisoned - spine urchins which abound, one  
Morse Eel sighted. Beautiful reef fish &  
amazing slate - pencil urchin. The  
current in crossing sweeps feet toward  
Waimanalo Bay, but can be strong  
enough to arouse conflict in rowing, on side  
always sweeping raft in circle. We must  
look very funny indeed to the tourists lining  
the shore. Imagine the scene. 4 mucky men  
putting an undersized raft out to sea from a  
rocky point, trying vainly for calm. The



cursing & punning after we push us back, & cheer as we pass the line of surf. Now the tour buses line up to watch as the raft, filled with water, refuses to move at any speed, while the intrepid crew paddles in an extravagant waste of energy. The tourists must be laughing as the raft hits the current, & our paddling only induces the stubborn raft to moving around & around in circles. Finally heading correctly again, they cannot help but ~~notice~~ notice the drum containing our clothes (hopefully dry) bobbing about in the water - laden raft hitting our snobbish knees with each swell. As we reach our island, we fall out & swim to shore - this time we remember the anchor, & the tourists with binoculars must be so little amused as we are rolled up over the rocks, looking startled but happy to find once again land under our feet. We are at last ready to put rings on our birds, finally consenting their long sinful life in the burrows, legalizing for all to see the relationships the paired birds had lived ~~in~~ in their burrows before our arrival.

Bulwer's - 2 downy young (0-10 days)

Wedgetails - 300 ± 10% nests, 145 banded -

all on eggs. Frigate (1), Ruddy Turnstone (5), Noddy & Sooty, abundant.



24-30 July - Honolulu - putting up birds,  
errands in town, red tape at Pearl City  
for supplies, etc. etc.

30 July - 2000 - Honolulu to KAUAI.  
arrived PM, motel - tomorrow to the  
fabled Alakai swamps.

31 July 1964 Kokee, Alakai Swamp Trail,  
Kauai, Hawaii!!

Kauai is indeed a marvel of an island,  
green & lush for the most part. The drive  
along S. coast from Lihue is superb, with a  
view of the island encircled interior rising  
high above. At Waimea we turn inland.  
It is dry, xerophytic vegetation, with  
Opuntia abounding. As we climb, we  
pass through a narrow belt of cane,  
then see wild, undeveloped country  
above, becoming more lush as we rise.  
Waimea Canyon is very large & extremely  
impressive, with cliffs dropping over  
2000'. The canyon bottom is 2800' below the  
rim, & colors play about the canyon walls while  
rain feeds the upper reaches. ~~Below~~ Below  
a dozen or more White-Tailed Tropic Birds

Also on road.

Linnet  
Calif. Quail  
Barned Swallow  
Eng. Sparrow  
? pheasant



hatched  
Calf. 2  
Hatched 2 days  
2 present.

- 37. Creeper
- 38. Iiwi
- 39. ANIANIAU
- 40. AKEPA
- 41. Chinese Thrush
- 42. HAWAIIAN DUCK
- 43. Junco - Sowl
- 44. Linnet
- 45. Calif. Quail

hatched  
Calf. 2  
Hatched 2 days  
2 present.



Hawaii - 31 July 1964

34.

fly about, circling lazily. Perhaps Newell's shearwater is also to be found there.

We then go to the Kalalau lookout. Here is the most astounding, stupefying view ever to behold, sheer pali (cliffs) dropping 4000' to the canyon below, with jagged rock edges silhouetted against the blue of the ocean beyond - green beyond imagination, the rim we are upon clinging with tree ferns & Ohia trees, while Apapone & Zosterops flit everywhere in the trees. Never have I beheld such a sight. I should like to

return again & again. One does not see Hawaii on Oahu, that is like knowing Calif. without seeing Yosemite, Point Judo, or Joshua trees. We suddenly turn away & head for the Maunaloa River Rd. & the Alakai Swamp Trail. 6 mi. of rough road, 5 mi. of tough trail to the swampy cat. We do not get into the swamp, just reaching its borders, but do see: Apapone, Creepers, Ibis, Arizonic, Akaka, Elepaio, Zosterops, Chinese Thrush, Hawaiian Duck, Jungle Fowl, & Trogon birds. The area is a plantamagoria of Tree Ferns, tall grasses, berries, Ohia, Koa, steep canyons, - green green green. As one leaves the road the introduced fauna & flora slowly drop out, leaving at last native forest.

A/so  
Short-eared Owl



1 August 1964      Kauai, Kehee-Haena Rd.

This morning we again set out to Kalalau lookout, then proceed along the Kalalau-Haena Road-Trail.

This gets us into virgin forest much more quickly. Although the trail is obscure & very rough, the beauty presupposes tiredness as we hike along, wet to the skin from the ferns we must force our way through. We stop after a short while as the trail begins to head off toward the interior. Then Amakihi flits to within of looking us over - a perfect view of this bird - less common here than the others. We see all the honeycreepers we saw yesterday as well - more rapidly. They also seem much more abundant. This would be a great spot to stop in looking for some of the rarer forms, such as OU or OOA.

We get to airport  $\approx$  1630, & having 2 hrs. to kill, drive to Poipu & about. We miss plane, & eat before the 7:30 PM flight back to Honolulu. A would certainly like to spend more time here.

1 Western meadowlark in cane fields.



46. Amakihi

47. Short-eared Owl

48. Western Meadowlark

at sea

49. Newell's Shearwater

II 19-64

{ 50. Coot

{ 51. Gallinule (Common)

Oahu, Tantalus

52. Shama

Oahu, Kauai  
Common

53. Cardinal



2 Aug - 4 Aug 1964

36.

Honolulu

Much sit & wait work, very little to do. On 3 Aug we see Ken, Paul, & other at-sea members off. Gill, Huber, King, Hunted remain, sitting off the big island.

PM - To Waikiki Beach - my first swim there.

4 Aug - AMAZING - I am to go back to Kauai to do some work with King on Newell's. AM. I go to Pearl with Hashman & get all the blood material together for Sand island. Then at 1530 we fly off to Kauai. Nothing works right, we cannot get our helicopter today, nor beg to Hahai runway. We finally decide on Koha first night to listen for Newell's. The first person we see is Maggie. She comes to Kalalau to listen, then to Wai'an overlook. ~~The big surprise - we hear 3 or 4 birds that can only be~~. A few Newell's are heard, from both the Kalalau lookout & the ridge further down Kalalau - Kaena Rd.



Wed. 5 Aug 1964

Kohala - Haleakala Swamp Trail. 37.  
Waimea Canyon.

Left Maggie & the Lodge over at 20700 and drove to the end of Mokuhiwa Cr. road. We hiked directly to the cabin (5 mi) & then, in from there. A trail crew is busy clearing brush & logs - to be done for. About 2 1/2 hr. hike in. It is well over 1/2 way the trail before flora is really Oahu with tree fern understory. The flat just past the cabin is the most amazing piece of ground I've seen, with the flora entirely, stapled fern, tree fern, epiphytes everywhere. Some huge tree ferns grow as epiphytes upon other trees. We saw the 5 common honeycreepers (no Amakihi) & heard what was probably an OU! We failed to locate it. Also heard many & saw 1 O M 40 - one of 2 endemic thrushes. (*Phacornis inornatus*) We came out this evening, the round trip easily made in the day, round trip of 12-15 mi.

We ate a quick, cold dinner of pineapple juice, pepperoni, plus, & tomatoes, after consuming berries & some stew on the trail. Breakfast was cookies (2) & a crust. Feel amazingly well fed.

At 0950 went looking for Newell's, heard both this & HRCORT'S from Waimea Canyon overlook - tomorrow - into the canyon!

Stayed 2nd night with Maggie in her down - supply. The people at the Xian Corp store & their car thoughts most likely.



OU - prob. heard this species

(54) Omoo - (Hawaii Thrush

(55) Harcourt's Storm Petrel



6 AUG 1964

Kokae, Waimea Canyon via Kokoi Trail

38.

See Erekle's Transcription

Up at 7. After eating bits, we drive to Waimea for grub - oranges, U-8, Cookies, Caramels, pines. We find out that the Xians have told the Lodge Manager of our presence, & therefore we must leave. Mayjor has O.K.'d all, but has been caused a great deal of trouble. We can leave our gear with the museum lady, who is most kind. We find 3 mis-labeled birds, Telling her same, which she corrects - Akepa (instead of Anianian), Hawaiian Noddy (called Common) & Newell's (unlabeled.) We attempt another Alakai Swamp Trail, a road leading off to the left from the Mohihi Rd. at the sign for the Kona Forest Preserve. Our feeble jeep failed to make a grade, & we had to turn back.

At 1500, our gear stored at the Museum Lady's house, we began our descent down the Kihuna Trail - 4 mi. to the River 2800' below the rim.

We find the trail down very good, & camp under a tree in the middle of a guava forest - guava run wild & all over the ground. One house visited our camp, so we put our food in a tree before descending the last 1/4 mi. to the River.

A swim at 1630 is most refreshing after our hike down. The water is brown but not muddy, & the swim most refreshing - Tadpoles abundant.

We eat & head out to a listening pt. Our first hill is covered with lantana & prickly pear, & is extremely rough going. A sheer cliff finally



(56.) Erckle's Francolin



6 Aug 1964 (cont. 2)

39.

forces us back. As dusk approaches, we climb up a dry gulch + a ridge, arriving just - 800' above the canyon floor (600' elev.). At 2010 we hear Calls - Harcourt's Storm Petrels arrive. At 2015 Kennell's calls are heard - not as many Kennell's as Harcourt's (about  $\frac{1}{2}$  as many). The birds are all above us. Were below us last night. Thus we pinpoint the nesting sites at about 2000 - 3000' elevation, probably ~~at~~ on the steep grass slopes scattered throughout the steep cliffs.

At camp, we hear some Nivalis' + Harcourt's above us - not as many as in the steeper part of the cliff. To get at the birds, we must get some ropes - Van Hoeman is probably the man for this work. Perhaps next spring.

En route to Warner, we find Erskine's Franklin along the road - 1.



7 Aug. 1964

Kauai

Waimea Canyon

40.

beach

Kilauea Lighthouse

We are awakened at  $\approx 0430$  by calls of Newell's leaving the canyon. We sleep now more, but by then the Jungle Fowl are calling, so we get up, eat, & begin the ascent - it takes 2 hrs & 5 rest stops to climb out - what a battle - there were times when we doubted we would make it.

On drive down, we see 3 Chukar Partridges. We then head to a beach some 3 mi toward Pali Coast from Barking Sands - what a delight. 2 mi long, 200' wide - pure, clean white sand, backed by high dry scrubby cliffs. As far as we can see in either direction - no people. A n. house in the surf refreshes us after our exhausting climb.

At  $\approx 1500$  we head out to Kilauea Lighthouse. The Red-footed Boobies nest here in great abundance - calm & not at all worried by our presence. The marvellous beaches, cliffs, clean water, & the boobies, frigates, & wedgetails are fantastically beautiful. The accessibility is important. Moku oea should be visited - perhaps houses Belueers.

The lighthouse, mentions Newell's flying into the light frequently - perhaps we can catch some for us - he agrees to a proposal to do so.

At 1930 we climb aboard plane & head to Honolulu.

8 Aug 1964 - Potting, buying material, generally round - house activity.



(57) Chukar Partridge



Kayler

9 Nov 1964

Honolulu  $\rightarrow$  Johnston Atoll - Sand Is.

41.

This is indeed a long day. At midnight still at E-W center with Kay, we leave at 0100 to see Dick Stephen - to ascend at the Eldridge's home. Talk to 3 or 0400, then talk more, finally arriving hotel at 0505. Since I am to get up at 0515, I don't see much point in going to bed.

Plane leaves  $\approx$  0750, a 3 hour flight to Johnston. From the air I can see 5 islands, Johnston proper, Sand, W, E, & one other. Landing is made & check in procedure is relatively simple. I then get a Coast Guard boat to Sand. The water around the Rocks teems with a type of Pike-fish, but is very murky due to all the dredging. I can't wait to see the sights underneath.

Sand is great - small & bright but full of many boats. Now noting one Bulwer's, Wedgetails, Red-tailed Tropic Birds, Brown Boobies, Frigates (minor), Gray-backed Tern, Gulls, Sooty Noddies. The Loran tower wires hold innumerable Frigates & Red-footed Boobies. I think I shall enjoy this stay.

As I write on the dock, bananae run about, & overhead soar Frigates. One is chasing a common Noddy, who again & again ducks into water to avoid the Frigate. Finally minor tires & moves off.

At 2130 we collect 4 Sooty Tern Samples & 1 Wedgetail blood sample - collect the 4 Sooties & 2 pacificus.



Kepler

10 Aug 1964

SAND - Johnston

42.

Work done:

- 1) Check mice, noddy eggs, wedgetails on eggs, set mice traps, 42 Sooty Tern Blood Samples (2 each), packing Sooty Terns off with Dave.

Saw Bratley off at 1900. PX call on Johnston.

11 Aug 1964

Mice check, noddy egg, Wedgetail on egg - 2 on islet have hatched - 1 white, 1 brown. 70 Sooty Tern blood samples, 2 birds / sample. We were getting a good touch, & could get heart on most times. Needle goes directly under sternum & back at about  $15^{\circ}$  -  $20^{\circ}$   $\angle$ . The beating heart can be felt if syringe is held lightly - it beats back & forth. The needle is in  $1\frac{1}{2}$ ". We handled 140 birds, & lost only 1 through accident. Last night we worked 84 & bled 2. Improvement. If you get air - you have gone too far.

Beginning Booby work. Caught & marked 8 birds - 5 young & 3 adults

12 Aug 1964

Wedgetails on islet, in burrows, mice, Noddies. We weighed Noddy Chicks - this is really a major undertaking. The birds behave well on the scales, however, simply standing in a hunched position on the pan. All told, we weighed & measured 68 Noddies &



12 Aug (cont.)

1 Bulwer's Chick. We were too gooped for blood work last night, what with spinning down 70 blood samples. Rain most of day.

13 Aug. 1964 - We rather lost this day - the census on Johnston taking the afternoon from chow to 1600. There is very little in the way of birds out there, only 18 Fairy Terns & 30 adult red-tailed Tropic-Birds were spotted. The Tropic-bird nests, scattered about only where there was thick vegetation, contained 3 eggs, 6 chicks, & 4 juveniles.

After a flick, we took blood from 94 Sooties - 47 samples. That leaves only 40 samples & our Sooties are done - it is a good thing as most of the pop. has left.

26 Aug 1964

Today saw an unusual shore bird for here - a Sanderling. 1 only.

29 Aug 1964

Johnston Is. - 1 White-tailed Tropic bird found, flying over PX.



Kopler 64

58. Sanderling



14 Aug 1964 - A memorable night trying for blood samples after a party which Phil. hit with grand style. After getting 20 samples, I leave & try to get Phil to do the same - he persists in his ineffective spearing of the birds well after I leave, refusing to admit to his ineffectual inefficiency, and gets 44 more samples. I quit around 12:00 PM, Phil goes on a few more hours.

15 Aug 1964 - A.M. - Went out to reef with J.L., Wally, Bo, & Briggs skin diving. Went a fantastic array of fishes - surgeon-fish, trigger-fish, box fish, all set against the unbelievable fan-coral that abounds. I have never seen such beauty. P.M. - Phil spins blood while I check noddies & Wedgetails. After dinner we got Pond to help us catch Wedge-tails in their burrows - we painted many and quit  $\approx$  12:30 PM.

16 Aug 1964 We went to other end A.M. - spotted, watched, & collected bird which may or may not be a Wilson's Phalarope. P.M. - count of Boobies & Frigates on the wires.

17 Aug. 1964 - Rain all day! Found Great Frigate, which was bled (20 cc.), ectoparasites collected, then frozen.



1964

45.

18 Aug 1964 - Usual - 24 Wedgetail samples  
Phil → 5 Known age Noddies collected  
Age (3, 13, 18, 25 days, oldest is unknown)

19 Aug - Usual routine - 24 more Wedgetail samples.

20 Aug - Mouse traps checked AM, Phil spun down  
Wedgetail blood - breakage much too high. We  
must slow down centrifuge.

Collected 20 more Wedgetail blood samples,  
4 Adult Noddy Terns (also bled)

21 Aug - A change of Cubes - hurrah. Much linen  
here. Phil got plastered again & forgot about the  
change of cubes, sleeping in the old one - no linen,  
etc. Usual routine outside of that.

22 Aug - Usual routine - One of the young  
Xmas Is. Shearwaters left today.

23 Aug. - 36 Wedgetail samples collected (Total: 101)  
Flock of 24 Ruddy Turnstones seen. Next we will  
try to get Noddies - much more difficult birds.

24 Aug. - Mapped Sooty Tern boundaries, usual checks.  
collected 48 more sooty tern samples.

25 Aug. Pat Meahan (Holmes & Narver) brought an imm.  
Sooty hit gyrfalcon on N. is. Will recover Sat. to see



1964

46.

25 Aug (cont.) Sand Is. 2nd Xmas Island  
Steamer left today.

26 Aug. USCG men see White-Tailed Tropicbird  
on Johnston Is. Sanderling seen here.  
P.M. - 57 Sooty Tern Blood Samples.

27 Aug. - routine checks during day. In afternoon  
more blood spun down. Phil is making a night  
mouse cage. Phil has OK from C.O. to remove cats.

28 Aug. - More blood spun down. Phil collected 5  
species of plants from Sand. At night much  
activity in the Wedgetail colony - moaning,  
billing, digging.

29 Aug. - Again routine. Saw White-tailed Tropicbird  
on Johnston.

30 Aug. Normal AM routine. PM - bleeding  
attempted. Noddies the Target - are very  
difficult. They are weak, & 6 cc almost kills a  
bird. We decided to pool blood from 2 birds,  
taking 4.5 cc/bird. They are weaker from this  
than Sooties after 5 or even 6 cc. Noddies are tough  
to catch also. 100 samples is much to lay a good  
We catch & bleed 1 of Frigate.



31 Aug. 1st mud bird census while Phil collected about 20 species of plants. Found:  
13 Fairy Terns, 10 10 Juv., 4 Imm (downy), 4  
4 Red-tailed Tropicbird eggs, 35 Golden Plover,  
1 Common Noddy (broken wing), several wedgetail  
Scurrows. Showed Pat Moench's friends around after  
feeding them here.

1 Sept. - Dr. Arnold Joseph (Maine Biologist, AEC)  
came. Showed him about island. He was working  
on radiation effects at Behni, Eniwetok, &  
Rongelap - saw very few birds there.  
(Collected an unusual shorebird P.M.  
→ # Spotted Sandpiper.

2 Sept. - Weighted Noddies - Usual routine.

~~2 Sept.~~ 48 more Sooty blood samples P.M., same time  
banded 100 birds. Banded Bulwer's chicks.

3 Sept. Burested's report, misc, etc. Thermograph  
going again. Temp. fluctuates between 80°-85°.

Fri 4 Sept. 1st guanine census. We got up at  
0430 to watch another sunrise of the rocket.  
I ran census down to 1130, Phil took over soon  
to drink. Banded 100 Common Noddy chicks.  
1 downy sooty tern seen.



Kepler

63. Spotted Sandpiper



- 5 Sept - Routine. Phil went deep sea fishing, & noted that the albigers relied on birds to lead him to the best fishing spots.
- 6 Sept. Normal A.M. Collected 49 Sooty samples P.M., banded 100 Sooties.
- 7 Sept. Skin diving for 2<sup>nd</sup> time. Again extremely impressive. Found a fantastic garden of stinging coral on reef. The reef area is broken & rough, but seems to have more fish than elsewhere.
- 8 Sept. Sooty samples completed with 9 whole blood + serum samples (lost 5 Sooties who had 8 to 10 cc. drained out - 4 survived this fantastic exsanguination). 1 regular Sooty sample taken. Phil banded 150 Sooties as usual.
- 9 Sept. Weighed Noddies again - each time there are fewer to weigh. The Bulwer's chick has left. Lucky we banded it on 2 Sept. Sooties almost all gone - I spun blood while Phil banded - & when I finished he still hadn't finished. I helped him & then we bled 2 Noddies & 3 Frigates. We overzealously grabbed two Frigates each & then found ourselves in a dire predicament - what to do with these



beasts! We finally carted them off to the holding cage, then  
blew them.



Sept.

49.

10 Sept. - Routine M.S. Went to Johnston PM & spent whole afternoon, after getting our gear, loading CG materials around.

11 Sept. 2<sup>nd</sup> buoyine census. Phil down to noon, I got noon to dusk. Much fewer birds than last time. Mist net up S. of barracks - it looks hopeless.

Sat.

12 Sept - Usual day. Wedgetail plots are abandoned by us - almost all chicks now, adults seldom in at all. Shorebirds, after increasing last 2 weeks, appear now about steady. White-tailed Tropicbird - Johnston.

13. Sept. Skin diving on North Island - this area is richer & much much different than near the reef. Water 20-30' deep, coral heads rising to near surface, land rugged & mountain-like - some beautiful brain-coral structures. Saw Cornet fish 4'-4½' long. This bizarre specimen changes colors within 1 sec., from an all-over green to an alternating dark green - light green speckled appearance. The chromatophores must be under direct <sup>neural</sup> control to elicit such a rapid change. Many butterfly fish, squirrel fish, wrasse, Red-snapper, Surgeon fish, box fish, Parrot fish, Moorish Idols, etc.



Saw Labroides of cleaning Needle-nosed fish near  
waters surface - 2 Labroides working. It looks as though  
the Red Snappers are strongly territorial - one / for coral  
structure - hiding underneath it. Saw a new  
species of triggerfish - instead of the normal black dorsals  
anal fins - fins were white bordered with black.  
Body normal purplish-black color.



14 Sept. Usual routine. Word from Ely of our  
bird shipment - 25 Sept.

15 Sept. Up early AM to catch meter boat to Johnston,  
but it didn't come to Sand. So - catch 2:00 U.P.  
run - census Johnston. Took #5 bomb for  
Tropicbirds, but ~~somebody~~ #3 Jaws don't fit -  
too small. Banded only 2 birds. AM - Sand - Saw 1, only  
1, BRISTLE - Thighed Curlew. The uppers  
of the undercoverts & tail coverts shows clearly.  
I was glad to see & get some pictures of him.

16 Sept. - Usual routine. Many recovery sheets completed.

17 Sept. - Phil over to Johnston to check on weights of bird  
boxes, etc. I spent afternoon wrapping & tidying up  
cubs - big inspection on Fri.

18 Sept. Phil AM, me afternoon on Isupine run.  
PM - see the Bristle - thighed Curlew against the  
barracks, probing among coral rocks. We catch a  
petrel, but cannot key him out as to species.  
Looks like a Phoenix Island Petrel, but the  
measurements are not quite right, & the leg  
color is pink, not yellow. We will probably  
collect him, although I hate to do it. The measurements  
are as follows:



(59) Bristle-thighed Curlew

64. Pterodroma alba?  
sp.

Length:  $12\frac{3}{4}$ "

Tarsus:  $2\frac{5}{6}$ "

Wing: 11"

Tail:  $5\frac{1}{2}$ "

Bill:  $1\frac{1}{2}$ "

Wt: 280 gr.



19 Sept., 1964 (Sat.) - Spent a few hours at PX, then, since the water was clear around here, went diving on North Side of Sand. Saw a great many new fish. One school of 500-600 mullet circled me, swimming round & round - so thick I could not see through them - really great. *Thamnocheirus* - *nukunuku* - a few were very plentiful here. Most of the coral has been killed by the coral dust following dredging, but some pieces are still alive & may make it if it stays clear.

20 Sept., 1964 Diving North Island. Phil has his new Nikonos underwater camera & takes many pictures. The camera is a good one - I hope the shots come out. Two men spear a Moray Eel - prob. 25-30" long. The largest I have seen. The water clear as a bell. *Thamnocheirus* & *bananoides* now reported ~~as~~ as casual within the reef - perhaps they will begin spawning. We have yet to see either.

Divers were spearing fish for photography on land. We take them & preserve them - 5 butterfly fish, 1 Moorish Idol, 1 wrasse, 1 Trigger Fish, 2 Surgeon Fish & , other?

I hope the color lasts - I have photographed them, however.



- 21 Sept., 1964 We decide to bleed the Pterodroma.  
 It dies in the process, so we collect it. Perhaps  
 Ray Galloway will recognize it when he comes  
 near the 24<sup>th</sup>.
- 22-23 Sept. Routine. 23<sup>rd</sup> we go to Johnston, get boxes for  
 bird shipment.
- 24 Sept. Getting Ray, assembling & painting addresses  
 on boxes. PM - collect 160 line Wedge-tails,  
 box them up. They are easily caught as the night  
 is very still, almost no breeze at all.
- 25 Sept. Miss Gwynne censuses due to transporting  
 birds to Johnston. All goes without a hitch, &  
 we say farewell to Ray & birds at 1130. At  
 Security Badge office the men have a fine young  
 Fairy Tern. Phil gets picture taken of it on his  
 shoulder. 5 Wandering Tattlers seen.
- 26 Sept. Gwynne censuses. Also, collect a Pectoral  
 Sandpiper. The bird is then frozen.
- 27 Sept. - Checking Noddies - a Juv. Brown Booby is  
 found dead, with a large # of eggs on head &  
 neck, attached to barbs of feather. Several clays  
 are collected - bird will be photographed later.



60. Pectoral Sandpiper



27 Sept. Phil Depart. How to carry on alone until Dennis arrives on the 5<sup>th</sup>. ▽

Tue.

29 Sept. Normal Routine

30 Sept. Johnston in A.M. Construction continues to destroy nests & young Red-tailed Tropicbirds. Gene Zengdon has agreed to call me if the nestlings are to be destroyed en masse - they could be easily raised here. Noddy run this P.M. Bill Smith helps me by catching the chicks. All the Noddy eggs are hatched now, & few chicks remain. In 2 or 3 weeks this study will be completed.

10 October 1964 Today Briggs finds a dead Imm. Frigate. It is preserved (frozen), after arguing it away from Briggs, who wished to stuff it himself. It is better off in museum. A rather broken winged young <sup>Fric.</sup> is found. Perhaps parents will be able to keep him.

2 Oct. - Most strange - while taking the Benjamin census, 3 Frigates wash in, 2 with obviously broken wings (both bled & destroyed, 1 skin kept). The 3<sup>rd</sup> bird looks in good shape - will make a pet of him if possible. Why so many sea-wine strikes today? Lots of birds



2 Oct.

about - 3 Fairy Terns, 1 Red-tailed Tropicbird,  
+ 4-5 Ruddy Turnstones. Pictures taken of  
Tattlers, Turnstones, Plover, Boobies, etc.

3 Oct. Check nine AM as usual, then take pictures of  
the Frigate pet. An Oxyechus is found, & we  
get some shots of it, as well as Manoua aged  
Wedge tails. Gular Pouches being displayed  
by 3 male Frigates.

4 Oct. De Beak (our Frigate) very reluctantly  
takes food if it is cammed down its throat. It takes 2  
people to force - feed it, and often regurgitates its  
preferred food. It is a young bird (white head) &  
should tame quickly. The wing shows no broken  
bones - so most probably a dislocated joint  
is the problem - prob. shoulder of its wing.  
We have caught about 10 lbs. of young  
goat - fish for him - should last a couple  
of weeks. I have his Booby - we now  
have a Frigate.

While feeding Beak today saw  
one young Frigate flying. Very clumsily  
on the wing - making jerky turns & flapping  
laboriously to keep up while circling  
all around sailed without effort. Pat  
McMahon, Gene Ferguson came over for a look  
about today - appreciated Beak. No Etoble.



4 Oct (cont.) today. Took pictures of *Molloyphaga* on Beach, also eggs (*Molloyphaga*?) on the Brown Booby found dead on 27 Sept. I hope they all come out. The bellows attachment is sure a great device.

5 Oct. 1964 PM Today banded 25 Noddy chicks. While banding the chicks, with Smith helping, saw a Donutcher on the beach. Markings on the back clearly seen. I will try to get a picture of this bird. Fed the Bear a fair sized Goat-fish. He is docile but will not take prepared food - still must be force-fed. He is stronger & alert, & seems to be OK. Long & regates not banded earlier are now ready to be banded. Will get them soon. Fed the mice early ( $\approx 7:00$  PM)

6 Oct. 1964 Lots happened today. AM checked the mice & caught up on recording data. Then there was a huge surge of calls from Johnston Island - grading operations were beginning S. of the runway. I had let the word out to workers & friends I had met skin-diving, and apparently word had gotten around, as about 6 people called. Took 10' dock V.H. run to Johnston & gathered up 7 Tropic-birds. - 5 are young. That leaves 2 unaccounted for - Pictures taken of Tropic-bird



61. Dainties



adults as they were released. The young have been placed on the islet out of harm's way. They all kept down food, & the youngest ate greedily, taking food from the hand. The others were force fed. This means we have 6 birds to feed - 5 Tropicbirds + 1 Beak.

Saw a Bristle-thighed Curlew today.  
The Brown Boobies continue to sit offshore.

7 Oct 1964

Am - nice as letters. Pm - everything went wrong after dinner. Went to Band Frigate, & broke the wing of the 1st young bird we handled. The band on the 3rd bird overlapped, & it took 10 minutes to ~~detangle~~ get it off. While doing so, the only flying young Frigate hit a guy wire with a sharp crack, & twisted up - hanging there in space from the horribly fractured wing. This was enough for one day - we got a .22 & killed the dangling bird, then left to feed the 4 Tropicbirds which, fortunately, ate very well & willingly. I will watch the young Frigate with the broken wing - he may be able to swim & heal if not disturbed.

Of the 12 Frigates - the 1st 3 flying broke wings, we broke a 4<sup>th</sup>, & 8 still on ground



8 Oct. 1964 1<sup>st</sup> thing after mice check went to see how Beak was doing - died during night - as kept as specimen. Meanwhile a new "beak" was found under E. guineas - no wing break but doesn't look well. Afternoon banded all Noddy chicks I could find - about 21 more - making 46 for 2 days work. Fed our 4 Tropicbirds after dinner - all ate voraciously. Caught up on bookwork P.M.

9 Oct. 1964 Another Frigate found dead, the bird found yesterday. This frigate was dead, had ~~been~~ looks in poor shape. An adult male bird. The Tropicbirds are in good condition.

~~10 Oct. 1964~~ Guineas census all day. Stadel arrives, pick him up on Johnston at 1:30 P.M. Show him around our island mecca here. He seems happy & willing to do his fair share. We feed the 4 remaining Tropicbirds after supper.

10 Oct 1964 Sat. Do North Island survey. All we find are 5 Ruddy Turnstones, 1 Golden Plover, & 1 Wandying Tattler. This is strange in view of all the shorebirds we have here. The plovers have are well spaced out, & there is a great deal of aggression between the birds. Banded potatoes accompanied by ruffled seagulls & land



vocalizations - classes are common.

11 Oct. 1964 Today was most eventful. One ~~large~~ Tropicbird has flown off. All primary feathers were dead when it flew. The outer 3 primaries of the oldest bird remain alive - it will be a time yet before it flies off. One rich of Frigate was caught + bled, ~~for~~ frozen as specimen 25015. A Sanderling + Zosterops were seen - 1st passerine I have noticed out here. We banded 100 Wedge-tails tonight - made several ~~measurements~~ <sup>measurements</sup>. 1 Frigate  $\rightarrow$  had a fully inflated gular pouch, & the throats of a # of others are bright red. A White-tailed Tropicbird flew over. White-banded Wedge-tails, a Gray-backed Tern was heard. Also picked up a Golden Plover with a bad wing.

mon. 12 Oct. 1964 - After checking the mice, we spun down blood samples from 2 Frigates, collected the Golden Plover (wing broken), & worked on recovery forms & schedules in the P.M. After dark we banded 50 more Wedgetails, getting several (4) chicks & a few dark phase birds.



Duck - Looked Like  
 Pintail in Eclipse  
 plumage.

Tue. 13 Oct 1964 - Johnston Island Survey - A.M.

Saw 61 Golden Plovers, 45 Ruddy Turnstones,  
 2 Wandering Tattlers, 3 Sanderlings, 9 Fairy  
 Terns, 1 King Wedgetail Shearwater, 1 King + 2 Ad  
 Red-tailed Tropicbird, & 1 DUCK!!! This  
 was seen on the N end of island & flew towards  
 sand. We later found the bird on sand & got  
 several photos of it. The Zosterops again  
 was seen today. We tried to shoot it but  
 without avail. Golden Plovers continue to be  
 aggressive, & the hunched posture & charges are  
 common. Gular pouches of Frigates continue to be  
 brightly colored.

Wed 14 Oct. 1964

AM - Caught 15 mice, collected 1 Imm. ~~bird~~  
 Frigate - with a broken wing. Collected many  
 Hippoboscids flies from neck, wings, & breast.  
 Bird was banded # 737-44544. Caught 11:00. Rode  
 boat to North Island, where Toni showed us thru  
 the computer center. It is amazingly like comic &  
 science fiction movies, with plotting boards, closed  
 circuit T.V., 2 computers, clocks? that continually  
 read of time (day - hour - min - sec) of Greenwich  
 time (i.e. - 288 - 22 - 15 - 06, 07, 08, 09 - ----)  
 At return we weighed Noddy chicks & did paper  
 work.



65. Pintail



15 Oct. 1964 At 0940 I found Adell watching the Frigate colony - wherein reside 9 yug,  $\approx 10$  adult  $\sigma$  & 2  $\phi$ . 10 minutes later, when a  $\phi$  flies over, all the  $\sigma$ 's give a display. The wings are outspread & inflated, the head thrown back, & the bill clapping, all accompanied by a vocalization harsh & screeching. The  $\phi$  flew back & forth over the colony before settling down. When I return to the colony with a camera, the area has been ~~extremely~~ disturbed & the  $\sigma$  have all deflated their pouches.  $\phi$  flying over fail to elicit the response. After lunch we begin surveying the Wedge-tail burrows to ascertain how many yug are present & how many burrows have been dug. We poke sticks into 848 burrows, covering  $\approx 1/2$  island, & find 102 chicks in their burrows. We prob. missed a few. We banded 73 chicks, most of which have all flight feathers growing in. ~~There~~ It is remarkable that most chicks are in the same developmental stage - there is very little spread in characters at all. We moved the mist net to a better location in the hopes of catching shorebirds.

Return from made out - AM.

Catch 1 Golden Plover in net - #642-01154. #1 written on jesse.

We count wedge-tails -  $\approx 3500$  Adults counted, with



15 Oct (cont) 1000 of them on the east bluff, an area where there are few nests.

16 Oct 1964 - Started day at 0615 for an early Gygis Census. Few birds out for some reason, fewer than mine at all. We had 1 Golden Plover in Mist net - banded #642-01155<sup>(#2 on Jesse)</sup>. At 1130 we had 2 Ruddy Turnstones (#642-01157-58) & another Golden Plover - #642-01156 - #3 written on Jesse. We continue with the Wedgetail Burrow Census, & use up the 535-1 B 800 series on the chicks.

The Plovers banded stay around the area where they have been caught - prob. very little movement over the island - the birds staying on territories they maintain. One Frigate chick beginning to fly, another juv. has hit Gygis - we will try to feed it & see if it can come around.

One Wedgetail chick was extremely light, & its feet dehydrated badly. Banded # 535-13907.

Apparently a Mr. Warlick of Johnston found a band - 793-78718 & mailed it to Wash. D.C., as an information card as it came here today. One of our Eoties banded June 10, 1964 - sent in to D.C. July 1964.

Two very young ♀ mine caught this AM in traps & marked 342 & 343.

Total Wedgetail chicks banded was 86. I found 2 birds with holes in the webs.

Two more Plovers - 642-01159-60 - Jesse #4 & 5.



17 Oct. 1964 (Sat.) - Checking of nets produced  
 2 more Golden Plovers. #6 & #17 -  
 given 642-01161662. #3 has caught  
 self now 4 times - seems that the  
 net is immediately in his area.

18 Oct. Kirkpatrick arrives at 10:50, we get him a seat  
 on Johnston. After introducing him around we  
 eat, & after ~~dark~~ supper we go to feed the  
 Frigate & the Tropicbird. The Frigate is much  
 better. Stadel drops his watch off the pier, but  
 I find it after Dennis brings up wash & fins.  
 After dark we feed mine & wander around. A  
 ♀ Frigate tries to land on his back, &  
 on mine. I think he will like it here.

19 Oct. How can the military make a 3 hour flight  
 an affair lasting 11 hours - they did it,  
 with long waits on both ends of the flight.

20 ~~21~~ Oct. R & R - Tour of island, photos -  
 15' surf at Haleiwa. Found a D&R.  
 - yoy. Chinese spotted Dove at Haleiwa -



21 Oct. R & R daylight. Popoia after Dah  
with Warenting, D. Kertel, D. Brattz,  
& Kay. The enjoyed it as we all did -  
warm breeze, full moon, birds, we all  
quite clean - we banded 300 adults.  
Most young have primaries & secondaries  
well along - I banded 3 birds still in  
down. 1 with no down left a  
flight feathers dying - almost ready to go.  
Young bird was quite clearly in down.

Thurs.

22 Oct - Shopping, out to Elg's - PM we  
showed slides of sea birds at Mike Oski's  
home - saw pictures of his trips to England  
& the Waterfowl Trust at Slimbridge -  
most interesting.

23 Oct - After one hour delay, set for  
Midway arrive 3:00. I am tired from  
long trip & night before, so work out early.  
Much rain & thunderstorms.

24 Oct - A field parade & inspection, plus  
the arrival of Santa Claus delays a  
trip to Easter Island until 18:00. Find  
1 human Remora (757-36357) on  
a badly decomposed bird, a return on  
1 of 2 Black-footed Albatross on  
the island (667-37029) found



up on the Eastern end. Wedgetails are about ready to fly on both Sand & Eastern, + only a few Tropicbirds (Red-tailed) left on well - all young about ready to go. On Eastern saw no Red-foots breeding & only 2 in trees, none in Seacave. There remain 300-400 Sooty Tern young, most of which have broken wings. Banded Sooty - winged birds were banded and bands recovered as follows:

recovered	{	813-75444	✓ 793-25675
		✓ 793-89867	- 88371
		- 89860	- 84912
		- 28979	1773-70081

Returning → Two "weak" birds: 813-75481; 793-25216  
1 Bristle-Thighed seen on Eastern.

At dusk Bonin Island Petrels begin arriving. Most flying by pairs, accompanied by calling. Saw many birds (sex?) sitting about 3' from newly constructed burrows calling. No eggs as yet. Appears to be courtship - chasing both on ground & in air.



Flight prepared - violent winds

65.

25 Oct. Many migrants today

Saw 2 Pintail-thighed Culems, 100's  
of Golden Plover & Ruddy Turnstones, 5  
Pectoral Sandgeese, 1 Downtree,  
1 Mallard ♀, 3 Sanderlings, 4  
Wandering Tattlers. Also 1 duck looks  
much like Scaup but:

TUFTED  
DUCK

1) Bill black tipped, rest pale blue  
2) Bill  $\frac{1}{2}$  between Canny & Scaup in  
slope from head, not the Red head or  
Scaup dip from head, but not as flat as  
Canny.

3) Darker color on back & flanks than  
Scaup, rump dark brown & black.

4) Broad ( $1\frac{1}{2}$ " stripe of white  
from body almost to tip of primaries -  
much bolder than either N. Amer. Scaup.

Met Jim Pierre, Mary "Leah" who  
is watching birds, recording band # 's &  
picking up recoveries for us on Midway.  
Much zeal & fairly good knowledge of the birds.  
but rained on again today - everything wet.  
Try for Bonin Isl. Pet. see can.

For Bonin Isl. Petrel Returns see over:



Bonin I. Petrel: Oct 25, 1964 Returns

Baseball D, picnic area - Midway (Sand Is.) 60 birds

753-32812	L 643-74397	} same bird
- 32081	R 643-49206	
- 33666	L 643-74502	
- 32062	L " - 74036	
R --- - 32953	L " - 74039	
R --- - 32943	L " - 74048	
R --- - 32118	L " - 74267	
R --- - 32765	R " - 74234	
R --- - 33587	L " - 74102	
	L " - 74099	

Recovery: 713-00251

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NW of Barrier Hanger (41 birds banded)

R 763-20352  
R " - 20098  
R " - 20019  
R " - 20317  
R " - 20324

R 693-57268  
R " - 57281

Recovery: 713-00728



26 Oct. It looked as though we weren't going to make the flight over to Kure again, but Kebschull decided to take a look to see if he could land, and after a pass over the island we set down rather heavily in the force of gusty side winds. This island is great. There is much important stuff going on, study that one can sink teeth into instead of banding and bleeding all the time. Most bird species are finishing up their breeding, but Bonins and Black-foots are getting underway. Fleet took me around to his Red-tailed Tropicbird nestlings and we took growth and development data from them. We found a marked seal on the beach with two unmarked ones.

I saw several Frigate encounters. One Frigate chased unsuccessfully a Red-tailed Tropicbird, another chasing another tropicbird forced it to disgorge but the booty landed in the Scaevola and was not retrieved.

One Black-footed Albatross showed up in the area across from the mess hall this P.M. It was a bird that had been previously seen. Bill let his homing rat go 1300 feet from the shack, and it was back in under 4 hours, a new record.

We caught and painted 184 Blue-faced Boobies after the flick, and found 3 new adults, unbanded and presumably not from Kure, at least since the project. All birds in the S. antenna field were painted red, N. A. F. - ~~black~~. were painted green.

"/ 27 October Most of the day was spent skinning, scraping fat, and pinning out flat mounts of Rattus exulans. A mangled live P. hypoleuca was killed and skeletonized. The skeleton box should be fixed up so that the wind does not move the bones about so. Walked part of the beach A.M. - saw no goonies or marked seals. One ad. ♂ ♀ G. Frigate was chasing a Red-tailed Tropic Bird without success.

The mist nets appear to catch large numbers of Procellariids, but have a notable lack of success with shore birds.

There are large numbers of Bonin Island Petrels coming in at night, but not quite so common as on Midway.

Weighed the last 3 Noddy Chicks. All were present.



(66) Tusted Duck



28 October Rattus exulans most of the day, there is still grease on my fingers. Noddy check 72 flying, 73 not in the area. 3 Bristle-thighed Curlews, 2 with orange streamers, were seen on the beach together near stake 46. They had flown there from the runway. ✓

We weighed the remaining Wedge-tails, Boobies, this afternoon. Then back to Rattus. Much transcribing of data on the Blue-faced Booby. On East beach there were no Black-footed Albatross.

2100 - Black-footed Albatross return - 737-45145, opposite from K 46.

Bonin Island Petrel return 793-20330, S.A.F.

Thru.

29 October The morning was taken up with the shore-bird census. I took the antenna field and found several Plover (23), 21 R. Turnstones, 1 broken winged Noddy, and 3 Bristle-thighed Curlew. ✓ On the beach near K18 was seal 208 under some Scaevola - very tame. Also found and then lost a B-f. Booby with a wing missing - the bird was later found by Bob. Band 697-70644. Later went with Bob on the RttB study. Bill off to Midway.

Fri.

30 Oct. Census day - long hours in the Radar tower. Good views of the Tropicbirds. ✓ Several feeding bouts were timed - all under 5 min. Many birds with flecks of black in wing (2nd year) often hovered around an adult feeding young in Scaevola, prob. not breeding birds but those with gonadal activity. Much calling as they flew about. ✓ Also Noddy chick weighing time, only 2 now left. Found a brown booby with a chick just emerging from the egg. Got picture of same as well as seal, very angry. P.M. a congregation of Black-footed Albatross on the beach - 6 of them. Bands are: 737-45504, 597-84051, one unbanded.

-45259

-45569

-93934

Two other Black-goonies on the beach.

Sat.

31 Oct. Finally got the Blue-faced Booby into the skeletonizing cage. Yesterday found Brown Booby with broken wing and a Frigate somehow injured so can't fly. The Booby will have to be frozen, perhaps



31 Oct. Cont. the Frigate will pull through.  
 This Am. went to Sand Island, counted 35 seals, got  
 tag numbers from 5 and tagged one new one - an ugly  
 old timer with shedding skin who was so tired that he  
 let us handle him without much struggle. Bob and I  
 set up a study area for Bonins, but that night only 5  
 were found in the 100' x 100' plot. These birds were painted  
 red on the breast. Seals were found at 1600 - number 176 on  
 north point and 208 in consort with an old bull.

1 Nov.

2 Nov. Several seals spotted on the beach, three of  
 which were banded. An imm. Frigate was seen chasing  
 an imm. Blue-faced Booby, forcing it into the water.  
 Twice the bird got up, each time to be forced into  
 the water again. No food was regurgitated for the  
 Frigate. Found 1 Sooty Storm Petrel!

3 Nov. This P.M. we check Black-footed Albatross  
 bands, painting the birds that we check. Of 56 birds  
 caught, 2 lacked bands. A group of 24 were found  
 at the beach just north of the dump.

4 Nov. Last night one of the Goonies barfed up what  
 looked like roe from squid. This A.M. a Ruddy  
 Turnstone was seen eating this barf. At 1100  
 about 400 Frigates lifted from the central roost and  
 flew south-east. A huge cloud hung on the horizon,  
 and the Frigates flew in front of the moving cloud.  
 At about 1115 close to 1000 birds were in front of the  
 cloud, the storm hitting at 1120. In an hour we got  
 .80" of rain. The Frigates drifted back singly or in  
 small groups throughout the afternoon.

5 Nov. Activity count all day. I had the early morning  
 and late evening counts. In the P.M. our first Laysan  
 Albatross arrived, 737-90718. After the count we went  
 out banding, and got 58 Bonins, and ~~more~~ 105 Wedge-tails,  
 most of which were immature birds. There was one Dark  
 Phase in the group. Bob found two more Sooty Storm  
 Petrels, digging under the Solanum. Apparently they  
 prefer vine-like vegetation to dig under. Bill saw them  
 on Laysan in Solanum.



(67) Sooty Storm Petrel



6 Nov. Shore-bird count in the morning. We tried drugging a monk seal this afternoon, but only succeeded in killing it. Although the dose of Sernyl was  $2/3$  of that used successfully on fur seals, it killed the monk seal within 45 minutes - perhaps the hair seals are much less tolerant than the fur seals, or perhaps this is simply a characteristic of the Monk?

The second chick of the Brown Booby pair died, but the first still lives, although today it looked weak. Measured the boobies and wedge-tails today - one wedge-tail has now lost all its down.

7 Nov. Again more paper work. Helped Bob with his Tropicbird growth and development data. Squared away the final Blue-faded Booby material - we are now up to date. After chow the crew jumped me and I got all painted, shaved, and banded. I was a god-awful mess, and now have no hair at the head.

8 Nov. Chuck arrived A.M. We walked all over the island showing him around, the view from the towers, tagged one seal. Did the Noddy Chick, only one now remains. After chow we read all remaining Black-foot numbers, painting the heads of all birds with green paint. Bob found 4 fish balls, no one else found any - ugh.

9 Nov. At 1200 a large group of Frigates left the North Point roost area, and a squall moved slowly toward the island; we did not know if it would hit us, but took shelter anyway, basically because of the flight away from the island of the Frigates. 15 minutes later the squall hit, and after it had passed a long phalanx of about 200 Frigates drifted back over the island.

At 1530 about 300-400 C. Noddy Terns were sitting in a tight clump on the beach near K2 with 1 ad. Sooty Tern, nearby were 3 Ruddy Turnstones and 6 Sanderlings.

At 1800 Seal 218 was found in the Scaevola near K30.

At 2100 we went banding. 168 Wedgetails, including many young; 1 C. Noddy, 3 Brown Boobies, and 16 Boning Is. Petrels were banded. There were many young wedgetails wandering out from their burrows. Study chicks 71, 4, and 5 were checked, and all were sitting within 3' of the burrow entrance.



10 Nov. A Golden Plover was recaptured today, and shows a great increase in weight from its first capture on Oct. 11, 1964, when it weighed 92.5g. At that time it had a prominent keel. It now weighed 117.7g - this an increase of 25.2g. in 30 days. It is interesting that they can come back from a weakened and very thin condition so rapidly. Spent good part of day working on Rattus skins, at 1500 went along north beach, saw adult female Gr. Frigate chasing Ad. Red-tailed Tropicbird, who barfed up fish, after which ~~it~~ she retrieved fish in air and returned to soar over the NE beach.

Found Seal 219 on N. point with an unmarked seal. One seal had a small round hole where a tag should be, tag presumably pulled out.

Found six fish balls.

11 Nov. It was a rainy day - 1.2" for the 24 hour period. Consequently we did paper work. However, Chuck and I went out after dark and banded 12 Frigates, 5 RFB, 9 Bonin Isl. Petrels, and 35 Wedge-tails. The Frigates and Boobies were taken from the fringes of the central roost, and the neck-pole was very useful for getting birds beyond normal reach. Several recoveries were made, including many new Laysans.

12 Nov. Activity count - this has been renovated and is now more interesting - we still make a colony count, but only once an hour. The rest of the time we observe whatever of interest happens. Today I noticed that the RFB. have a definite pattern to their leaving the island to fish. Birds will fly SW over the central roost, and then abruptly turn S over the runway opposite the Biltmore area, crossing the Scaevola and then turning SW again, catching the updraft from the Scavy along the beach. When they reach southpoint they head for the reef, and then cruise along a wave or two before heading out to sea. Others move along the East Beach from the north edge of runway and join those that come from the central roost. It seems that small flock formation is a function of the rather rigid flyways the birds have when leaving the island. Often 2, 3, 4, or 5 birds would fly together over the central roost, only to break up on the beach and reform with other birds coming along the East beach. Other single birds from the Central roost flyway would sometimes meet birds coming along the beach, so that usual



12 Nov. cont

usually small flocks of from 2 to 5 birds would fly over the reef together. ~~Imm~~ This happened repeatedly during the hours from 1030 to 1300 with the Red-foots, and is probably correlated also with wind direction, which was from the South today.

The Brown Boobies took a different pattern, flying over the West or inside beach along the Scaevola, flying along the beach, over south point, and then continuing along the inside of the reef until they disappeared from sight near Sand Island. Do all the species have their own route? This can be checked. Is the route correlated with the wind or rather stereotyped and independent of wind direction? There is probably a general pattern overlaying a wide degree of individual variety - time will tell.

After dark 5 Wedge-tailed (Imm.) flew into the side of the building near our quarters - prob. attracted to the light. The young wedge-tails are all losing down, several of today's study chicks had no quills alive, and tonight increased activity of the young is noted. Most will probably be gone very quickly now.

Copulations were seen in the Black Gooney for the first time. Several pairs now have nests - shallow scrapes in the sand lined with plucked, green Scaevola leaves. Laysans continue to arrive, but no displaying is yet evident.

13 Nov. The shorebird count occupied a good part of the morning. I had the shore, and counted 31 Golden Plover, 78 Ruddy Turnstones, 10 Wandering Tattler, 7 Sanderlings, 1 Bristle-thighed Curlew, 43 Common Noddy Terns, 18 Laysans, and close to 150 Black-footed Albatross.

Also on the beach were 17 Seals, the tags of 8 of them were read. One seal had a broken tag. No. 208 has new pelage, and is very clean and shiny looking in a deep grey, rather than brown, that she has. Other tags were 333, 214, 276, 342, 231, 202, and 249.

I banded a mist netted Ruddy Turnstone, finishing another string of 2 bands - 642-00300. Two Sooty Storm Petrels were found in the study area 2 where Bob found them several days ago. One bird we had banded 9 days ago - ~~642-00546~~ 642-00292. The other was an unbanded bird.



13 Nov. (cont.) I banded 9 Red-footed Boobies and 2 Gr. Frigates after dark. Number 7B bands are much to large for both species. Unless slightly flattened, the bands easily slip up over the "knee" and against the body of the bird, rather than staying on the tarsus. I don't think the band could possibly slip down over the toes.

An interesting recovery of an Imm. Frigate 737-45489 was banded as an imm. 13 months ago - so the bird is at least 2 years old and still in imm. plumage. Five other recoveries were obtained.

Many young Wedge-tails continue to wander about the island at night. Bonin-Island Petrel activity is not as pronounced tonight. These birds are most difficult to understand, as local populations fluctuate drastically from night to night - one night there appear to be close to 1,000 birds in the air, while the next evening very few - only a few 100, are to be seen. Many burrows have been dug, but no eggs are in evidence, and apparently won't be until Jan.

14 Nov. At 0900 I found a Black Gooney sitting on an egg - the first egg we have found this year. We checked later and staked out 5 study nests of the Black-foot. Four of the bird had eggs. The fifth (Nest 2) had an egg in her oviduct which could be clearly felt by pushing in the abdominal region. All other pairs were sexed by checking the cloaca - those females just having laid an egg had distended and inflamed cloacae, and fluids were dripping from the opening. The males were not distended and whiter in color, and lacked the fluid.

Paul and the skipper joined us in seal tagging this afternoon, and 5 new seals were tagged, 16 seals were found on the beach. On the north end of East Beach a Laysan and Black-foot were seen sitting and billing one another.

After supper we made a booby census, and in the N.A.F. we found 111 ad. and 22 yng. Blue-faced Boobies; 38 ad. and 14 yng. Browns. There were 45 Ad. Blue-faced and 10 yng. in the South A. F. and only 6 ad. and 3 yng. Browns. ]

55 Ad. Blue-faced Boobies were marked for individual recognition, the breast and head being painted in a manner diagramed on overpage. A maximum of four





This bird would be R28



↳ = painted black

Blue-faced  
Boobies marked 11-14-64

Red Series

1764 nest  
↓

1. 667-35038 ♀ - #22, #50
2. 697-70657 ♂ - #50
- \*3. 697-24501 ♂ #19
- \*4. 697-24514 ♀
5. 697-70662 ♀ - #44
- \*6. 697-24502 ♂ - #52
7. 597-83253 ♂ #25
8. 697-70664 ♀
9. 597-83279 ♂ #35
10. 667-35075 ♀
11. 697-70661 ♂ #21
12. 667-35028 ♀
- \*13. 697-24526 ♀ #5
14. 667-35058 ♂
- \*15. 697-24522 ♀ - #15
16. 667-35035 ♂ - #22
- I-17. 667-35055 ♀ #29
- I-18. 697-24505 ♂
19. 697-70663 ♀ #36
20. 697-70658 ♂
- Orange  
667-35030 #7 21. 697-70920 ♂ - #7
22. 697-70652 ♀ - #47
23. 667-35039 ♂ #10
24. 667-35056 ♀
25. 667-35073 ♂ #53
- \*26. 697-24524 ♀
27. 597-83280 ♀ #16
- \*28. 697-24523 ♂

Cat Black

Flower Series

1764 nest  
↓

- 697-70919 ♂ #23
- 667-35032 ♀
- ✓697-90198 ♂ #3
- ✓667-35051 ♀
- \*✓697-24527 ♂ #38
- ✓667-35037 ♀
- ✓697-90197 ♂ #31
- ✓697-70654 ♀
- 667-39220 ♂ #17
- 697-70651 ♀
- ✓667-35065 ♂ #12
- ✓667-35045 ♀
- ✓667-35049 ♂ #42
- \*✓697-24525 ♀
- ✓16. 667-39221 ♀ #13
- ✓15. 667-35060 ♂
- \*✓697-24515 ♀ #24
- 667-35041 ♂
- \*697-24518 ♂ #15
- ✓597-83269 ♀ - #27
- ✓697-70650 ♂
- ✓737-45120 ♂
- \*✓697-24511 ♂ #41
- \*✓697-24513 ♀
- 697-90199 ♀ #32
- ✓25. 667-35029 ♂
- ✓667-35063 ♂ #8
- \*✓697-24519 ♀

\* banded 2-2-62, Kuss, Al., Chen Robbins

see notes, p. 75, 87

Adults banded Jan., 1961, Kuss, Chen - 667-35001-110, 28-87.



Blue-faced Boobies  
Marked Blue and Orange

Blue Series

1. 737-95842 ♀ banded 11-20-64

Orange Series

1. 667-35057 ♂ nest #43.  
 2. 737-47001 ♂ with ♀ 24503 (8-24-64)  
 \*3. 697-24509 ♂ nest 14 (mate died)  
 4. 667-35059 ♂  
 5. 697-24517 ♂ - nest 11  
 6. 667-35047 ♀ - nest 2  
 7. 667-35036 ♂ } nest 1  
 \*8. 697-24530 ♀ }  
 10. 737-45121 ♀  
 11. 667-35069 ♂  
 12. 667-35067 ♀  
 14. 667-35052 ♀  
 15. 737-45111 ♂  
 16. 667-39216 ♀  
 17. 737-98231 ♂

21. 667-35030 ♀ - #7 (mate of 21, old #7)  
 \*22. 697-24516 ♂



14 Nov. <sup>(cont.)</sup> spots is painted on the breast, each spot assigned a number value, 1, 2, 4, or 7. The spot on the head is 14. By using combinations of these values, 28 birds can be marked with one color. Birds were painted with Red (R1-R28) and Copper (C1-C28). Birds paired at night were painted consecutively, such that two consecutive odd-even numbers are pairs, such as 1-2, 25-26, etc. The real power of these birds' bills was experienced, as one grabbed my hand, and Bob was actually shaking from the effort involved in opening the grasping bill.

15. Being Sun., we were overzealous in our relaxation. One new Black-foot nest was staked out by Bob. A north tower roost count yielded 235 Red-foots and 653 Frigates. ✓ One Short-eared Owl was seen as it circled around the tower before disappearing over the sea toward north point. There were many rats on the beach, but the owl ignored them - I'm sure he has no trouble finding food - he could simply stand on the ground and wait until a rat bumped into him.

16. Rat trapping All A.M. Two new records were set this morning - quickest time around area - 4hr. and 10 min. and the most rats caught in 144 traps - 146. After lunch Dave took us around the entire atoll in the boat. This took three hours. On the exposed portions of the reef (low tide) we saw both Wanderin ✓ Tattlers and Ruddy Turnstones, ✓ presumably finding food. There were many Brown Boobies ✓ sitting on rocks and one sunken ship that we found. Crossing the channel into the lagoon, a large group of about 50-60 Bottlenosed? Dolphins ✓ charged at us and escorted us about for 10 minutes or so, breaching within 10' of the boat and swimming ahead of the bow. Many small individuals were seen in the group, and tended to lag behind the leaders. Sand Island had close to 50 Seals, ✓ most of which were tagged. Tags were read. There were 30 ✓ Brown Boobies and 5 Blue-faced Boobies ✓ - two unmarked, on the island. Because of poor weather and the lateness of our return, we did not set rat traps tonight. ✓



17 Nov. This morning we made up stencils for more data sheets - I also made up data sheets for the Blue-faced Booby material I hope to get. Also made up card for a ♂ Gr. Frigate that had been sitting around the shack for 5 days. This bird is so equipped for gliding - even the barbs on the leading edge of the 10th primary are reduced, flattened, and compressed, forming a cutting edge to the leading primary. The ramus of this primary is flattened somewhat so as to form a more thin edge to the wind as the bird soars. The bird this morning was molting heavily, and was gaining new no. 4 primaries in both wings, extensive new rectrices in a apparently chaotic manner, and extensive body molt. The gular pouch was bright ~~orange~~ orange. The bird was apparently coming into breeding condition.

Three more Black-foot nests were staked out - two nest have been placed in such close juxtaposition that the eggs are 1 foot apart and the incubating birds must touch one another. It will be interesting to see if both nests last.

18 Nov. Rat trapping all A.M. We caught 155 rats, a good number of them new. In the afternoon I did the Boobies - the Brown Booby has gone - and the Wedge-tails. Three of the Wedge-tails have gone - so now there are only six left. So far all birds have had a very musty smell before they have flown off. No bird having the smell have been found on the next study day.

19 Nov. RATS AGAIN. It went a great deal faster today. We have been made aware of the problem with the Verbena on this island. Not found here a few years back, it has now spread to large areas of the NAF AND SAF, as well as spreading in clumps over many areas of the island. The stuff is so thick it is in many areas crowding out the Scaevola. It is rapidly invading fields of Eragrostis, Tribulus, Boerhavia, and Solanum, and kills these native plants with ease. We have pulled out large clumps, and the ground is barren underneath, nothing survives. There are so many seeds sown that I doubt that anything short of complete and continued effort could control it. If it continues to spread, areas now utilized for breeding by



19 Nov. (cont) Blue-faced Booby and Laysans, perhaps even Browns, will be crowded out by the Verbecina. Areas newly overrun this year that were used by Laysans this year are not used - the brush is too thick for the Laysans.

20 Nov. Rats all AM - the last of the rats for the month. In the afternoon Bob and I went after Laysan recoveries. We got some 130 recoveries and banded 20 new birds. Also, we found 2 Laysan eggs in the SAF, ✓ I forgot that last night we banded 19 Wedge-tails, 24 Bonin Is. Petrels, and a new Booby - new to the colony - banded No. 737-95842 and painted Blue 1. ← ad. ♀ I have taken a good number of notes on Blue-faced Booby behavior - there is a good deal of agonistic behavior in the colony, as well as pair maintenance ceremonies such as mutual preening or just standing closely together.

Sat.

21 Nov. I have the early morning activity count - we had a great deal of rain. Blue-faced Boobies seem to leave the colony singly, and go directly to the area in which they will feed. Several examples will illustrate this point -

0755 - 2 SAF birds fly over NAF, to lagoon, up beach and out along north point, angling over the reef gradually.

0844 - R6 flies from NAF directly out over the lagoon

0923 - NAF Bird flies directly to lagoon beach, moves south along beach out of sight.

0926 - R9 from NAF, flies to lagoon beach and N. along Scaevola, out along N. pt., then heads straight toward reef and out to sea.

0931, 0935 birds leave NAF, turn south along lagoon beach.

0944 - R11 and other bird leave NAF, fly to lagoon and join up, then R11 goes north in normal manner, other bird heads south.

This is repeated several times - it seems that the birds go directly to their fishing area. It is interesting that the birds head 1st the lagoon, westerly, when they fly to N.pt. and beyond, which is east of the colony. They were flying into the wind to get to the lagoon.



21 Nov. (cont.) At 1028 an unmarked Blue-faced Booby was seen flying over NAF, where it circled once, flew over SAF and circled twice, then to NAF, circled once before flying N. over scavy along east beach toward N. point. Is this new bird trying to get into one of the colonies. What is his status? I hope that we can follow several of these new birds as they try to get into a colony. We have marked one such - Bl, found in NAF.

Did Wedge-tail G and D, 2 more young have gone, leaving only 4 birds. On 18 Nov., only two of the birds had the musty smell - No. 18 and 47 - the two birds that were gone today. What is the function of t is scent? What does it communicate to the adults, if anything?

Sun.

22 Nov. Shorebird count in the noon time period, Bob walked the beaches, I did the interior. We had 85 shorebirds in the interior; 78 in the beaches. Totals

were:	Beach	Interior
	R.T. 47	29
	G.P. 22	56
	Bristle-thighed	3

There were 17 seals on the beach.

This P.M. Bob and I went banding Red-foots and Frigates in the central roost. In order to understand local island movement, all handled big birds are being painted according to thier roosting area when caught. This has been done with the totgal pop. of Blue-faced Boobies - SAF birds are painted red, NAF birds - green. All centrla roost birds are being paited red on the breast and head, north roost birds will be made green. We can only paint thebreasts of ♀ Frigates, the Breast and head of imm. Frigates, nothing on ad. ♂ Frigs. Red-goots can be easily painted if adult birds. We banded 6 Frigates, 21 Red-foots; recovered 8 Red-foots, and painted all red.



23 Nov. I tried catching all the Blue-faced Boobies that had been marked with the Copper Kettle paint. This turned green, and blended in well with the green mark already on the birds. All copper birds are being changed to Black - still C series (cat black). Only 13 of the birds were caught and remarked. All are numbered so that the odd numbered bird is the male, the following even number the ♀. Only exception is C17 (♀) and C18 (♂). The birds were caught during the day, but are extremely wary.

Since the day was so miserable - high winds and much rain (.48"), a good part of the time was spent doing paper work in the lab.

24 Nov. Before and after lunch we did  $\pi$  the plant plots, 8 of the 10 plots being evaluated. Data is gathered in terms of number of plants of each species, and total area covered per species, in each 25' sq. plot. The weather was so bad that two plots on the lagoon side in ravines between dunes could not be done because of the blowing and stinging sand. Some Black-footed Albatross had nested in these areas, and were waging a losing battle. In one area 2 nests had been undercut by the wind, and the eggs rolled out and down about 4' of slope. Another black gooney was sitting facing the sand, feathers ruffled and sand sticking in his eyes. The bird looked as though it couldn't make it. An abandoned egg lay 1' from the nest, the egg of another bird. After dinner, I began staking out Laysan nests. Four eggs were found in the NAF, and another nest was imminent, both birds hovering over a newly formed nest. All 5 spots were staked out - 25 nests will be so staked as eggs are laid - a nest attendance study is planned. Male birds are being painted with a green ring around the neck; ♀s have green spots on the flanks directly in front of the normal position of the wrists when the wings are held into the body. A green spot is also



24 Nov. (cont.) painted on the head. One female was painted red on the neck, but this was discontinued so as not to interfere with anything H. Fischer may be doing on Midway.

Wed.

25 Nov. While Bob and I finished the plant plots this A.M. Bill made ready for departure. The Black-foot in dire straits yesterday is still on the nest. The Scaevola has been heavily beaten back by the sand, and sand was covering many leaves - looking like snow. Most leaves on the lagoon-ward side are burned brown and withering, and most Boerhavia has been rolled up and is dying.

11 Laysan nests were staked out in the NAF this P.M., all new nests, including No. 29, where yesterday the two birds appeared to expect an egg momentarily. This gives us 16 nests staked, only 9 to find tomorrow. There are many completed nests now that lack eggs - they will be coming soon.

After chow did G. and D. on Blue-faced 56 and 3 Sedge-tails, only three birds left. Also got one-hour behaviorla observations in on the Blue-faced adults, including some neat sky-pointing and incipient nest-building displays in R21.

After the movie Bob and I banded 22 Bonins, 6 imm. Wedge-tails, 5 Frigates, and 16 RFB. One neat thing - a red Frig (painted 11-22 in the central roost) was found roosting in the north roost - this was an imm. bird. Perhaps our painting of him chased him from the other roost, or maybe they just move around frequently. The 21 large birds handled tonight were all painted green.

There were no ad. Wedge-tails tonight, nor were there the 22nd or since. We will run out of Puffinus within a few days.

26 Nov. THANKSGIVING Took it easy this AM. After thanksgiving meal staked out 6 more Laysan nests, 5 of the birds were ♀'s. Recorded who was in the colony of Blue-faced Boobies. After dark, Bob and I banded 1 Wedge-tail, 20 Bonins, 1 Laysan, 13 Frigates, and 18 RFBs. Got some Booby barf to feed the starved young RTTB that Bob found, it ate a prodigious amount, and now looks as stuffed as most of the crew, after thanksgiving meal.



26 Nov. (cont) - While banding in the north roost, we saw two green painted A\*U RFB, and 3 green painted Frigates, birds we had painted in the same location last night. Tonight, in addition to the 31 birds banded, we painted 6 RFB that were band recoveries.

"/xw 27 Nov. 1964. Activity study, all day. Results of our painting effort have already shown up - three Green-painted Boobies have roosted in the Centtal roost now. Most painted birds are Red however. The 1800 roost check revealed 8 Red Boobes.

Also staked out more Laysans, and did G and D on Wedge-tails.

The activity study today should be called an inactivity study - I have never seen fewer Boobies and Frigates in the air on the roost. At one point there were only 13 birds in the roost. Almost no birds flew by the tower all day, and it wasn't until 1 hr. before dark that BFB and Frigates began arriving.

28 Nov. I had the beach count for the Shorebirds. There were 200 Black-foot nests with eggs, several abandoned eggs, including 3 that were within 1' of another nest. There were 23 seals on the beach - the increase probably due in part to the disappearance of Sand Is.

There were 41 Laysan nests along the beach, many right in with the Black-foots. No hybrid pairs have yet been observed. Laysans in afternoon.

29 Nov. Laysans at 0800. Rest of day getting ready for plane. Arrived on Midway in the evening.

30 Nov. Wirt<sup>7</sup> and I, with Jim Priest, went to Eastern to check numbers of Blackfeet and Laysans. Bill had counted yesterday, but needed to finish some sections. There were almost 30,000 Laysans there.

1 Dec. Bill and I check in all of our equipment AM, flight leaves at 1600. After waiting about for customs check, and leaving some live Portulaca for Lamateux, we get to the Hawaiian King.



Dec. 2 to Dec. 6 Shopping about town, very little to do, weekend free - I spend some time body surfing at Haleiwa with Dennis. The surf is great - about 8' and breaking a good 200 yards offshore. Several good rides until darkness overcomes.

Second

Dec. 7 Errands - Shearwater leaves. ~~First~~ shot. First was on Thur., the 3rd Dec.

Dec. 8 and 9 - skinning birds with Husted all day each day at Chuck's.

Dec. 10 and 11 - Mounting plants all day at the University. This is a pleasant change. It is fun once again to be around students at a University.

Dec 12 and 13 - weekend, some swimming on the windward side, but it is very flat, so no surfing to speak of.

Mon.

Dec. 14 I had an immune reaction to the shot, and got a rather large sterile cyst on my arm - as a result I don't have to go to Pearl to get another shot this AM with Dayle and Bob. Instead I go to Pearl City and get enough blood material for Kure, as well as a centrifuge which they are lacking. This, as usual, takes most of the morning, and the material is then packed in the afternoon and readied for the flight to Midway mañana.

Dec. 15 Flight to Midway, arrive there at 1530, check in.

Dec. 16 Foul, rainy weather all day. It would be nice if we could keep some foul weather gear on Midway so that we could do more there in the rain. I have a blood sample drawn for shipment back to Honolulu.

Dec. 17 What a day. The regular flight to Kure got off at 1300, and we flew into strong headwinds all the way, arriving in 45 minutes, much longer than usual. The ground gusts were 50 knots, so we could not land. We flew around three times, made a mial drop (whew), and then left. The plane bounced all over the place, so I pretended to sleep so as to forget about the motion. No problems, except landing on Midway, which was rather hairy. It seems a good storm is coming, and we were already feeling the first gentle whispers of hello.



18 Dec. Rain and high winds all day precluded a flight and much activity. A check at the overrun produced nothing new, 1 Bufflehead is still here, as well as 2 Short-eared Owls. Frigate point surf is getting big, and the wind and sand are strong. One Common Noddy chick is there, and Jim Priest has been photographing it every other day. This is a month later than the last chick on Kure.

19 Dec. I find that again there is no flight to Kure. Winds strong, much rain, very cold for here. There is little to be done in this weather.



SON

20 Dec. Apparently, the wind, rain, & foul weather to the present time has been mere precursors of what was to come, because today we really got hit. Winds up to 65 mph. fortitude proved to have, & the plane was being bounced around all over to ground - they were put in the hangars. Jim Priest got a truck & we drove about looking at the scene. The channel was completely blocked by surf, & the old LST wreck was being engulfed by waves at least 20' high. Spray was flying well over 100'. The current going out the lagoon was prob 6-7 knots, & all transportation to Eastern Is. was stopped. The water was high on the island, & flowing over the sea wall at the end of the runway. A 4 Frigate pt. warrens had extended way over the beach & almost reached the runway. Large #'s of Goonies, mostly Black-feet, were endangered. I saw one Black-foot trying to incubate in 6" of water. Waves washed out many nests, & eggs were to be seen all along the beach washed out the furthest advance of the waves. Many nests not reached by the waves were destroyed as the heavy wind buried some nests (& about the birds) or uncut others.



20 Dec. (cont.) On Frigate point alone probably some 40 nests were lost. Other birds were engulfed in hard driven sand.

The selective advantage accruing to those birds incorporating twigs, sticks, Coccoloba needles, etc., is easy to see. Those nests were withstanding the blast of the wind without corroding away. Pure sand nests in exposed areas were completely eaten away by the sand & wind.

The storm flooded parts of the beach below officers' beach, & at least 5 Frigson nests were washed away. Two nests eggs were found in their nests buried 5" under drifting sand. One bird was sitting on a nest, the tip of the egg projecting out of the burying sand.

The pier at general beach (E.M. beach) broke up, umbrella platform at officers' beach collapsed, a high surf & winds continue.

Island, perhaps a dozen trees have fallen - only one dead gooney found as a result of this - some nests destroyed.



21 Dec. Winds calmed down to 30 mph.  
No flight to Kure. Sporadic squalls,  
some sun!

Jim & I walk the beach from BOQ  
to Pickett pt. - from Pickett to Frigate  
pt. is closed. The surf must really have  
come up; as waves washed over close to  
1000 yds of runway, covered rifle  
range, & flooded into woods behind  
ammo dump. What a mess. All goonies  
on Pickett Pt gone - many abandoned  
nests on rifle range, where blowing  
sand has covered in some places to a  
depth of 4' or 5'. Found 2 fish balls  
up on the rifle range in a  
long pile of debris. More trees down inland.

It is very hard to estimate egg  
loss, as most eggs are buried under  
drifting sand & I have no count of nests  
before storm, but both Jim & I figure  
500 nests lost along beaches &  
exposed areas with blowing sand.



22 Dec. Again gale predicted until after dark. So, have some time to look about. The weather is still bad, although the winds have subsided to about 40 mph. Rain in small squalls all day, temp low again. In the afternoon Jim and I climb 2 Casuarina trees looking into Hawaiian Noddy nests. One nest contained 1 egg, another nest is empty. It seems as though nesting is getting underway. Reports of chicks blown out in the storm, but none seen by me. It is remarkable that very little damage hit the Noddies, as they nest fairly high up in the trees. I saw no destroyed Noddy nests in the storm, although there were probably a few.

23 Dec. Success! I feel that Kure is home, and it is sure good to be back. A pleasant relief after Honolulu. The plane left Midway at 1100, and we arrived convenient for lunch. Dennis and I checked Laysans after lunch, as well as Blackfeet. There are 14 of the original Black-footed nests remaining - the storm really wiped out the island and these birds - I wouldn't be surprised at 50 per-cent mortality for their nests. The Scaevola has been extremely hard hit, and looks as though burned off. South point is no more. A third plane for the day landed with our blood equipment, and so we packed that into shelves and readied it for use. 13 Black-foot eggs were collected for blowing and shipping back as specimens - they line the beach.

After check a check on the Blue-faced Boobies. I still have much transcribing to do. There seems to be more sexual activity. Sky-pointing was observed for the first time. Also Bl was in the colony - the new bird to the island. After dark Dennis and I painted Red-footed Boobies, banding 11 new ones and recovering an additional 11 birds.

We collected 25 rats for the month - the are most numerous, particularly around the building, and easy to catch.

24 Dec. Activity Study took all day. It is very windy, and a rain coming out of the east hit us in the face all day. Very little activity on the roost. No painted birds seen. GULLS GULLS GULLS. We collected 1 Glaucous-winged Gull, saw another, saw 3 Black-legged



- (68.) G-lance - winged Gull  
(69.) Black - legged Kittiwake (ad & Imm. plumage)  
70. Herring or Western Gull Imm.



24 Dec (cont.) Kittiwakes, two in adult plumage, one in imm. plumage, and also saw another gull, either a Herring or Western Gull in Imm. plumage. Checked the Laysans and Blackfeet. The gull skinned out. Try that again - The gull was skinned out. The rain continued on into the night. Cold.

25 Dec. Christmas. We rest, read, and generally relax all day, only checking the goonies. A new storm is upon us - rain less today.

Blue faced Booby  
737-98231 Birth  
RD - unmarked  
bird - new to  
island?

26 Dec. Shore-bird and seal census, Laysan and Black-foot nest checks. The Blue-faced Boobies are much more active now, and sky-pointing is a commonly seen event, whereas it was never seen in November. Mated as well as unmated birds sky-point, and the functions are different depending on the status of the birds. Mated birds call their mates from a short distance away to the cleared platform, whereas unmated birds sky-point to any bird flying over the colony to attract them. If one bird flies over, as many as 6 or 7 birds may sky-call to it as it circles overhead. U. pt. - 4 Glaucous-winged Gulls, 1 ad. Black-legged Kittiwake.

27 Dec. We began blood work today and have worked out a reasonable system, carrying enough equipment for doing 24 birds. The work is complicated by the fact we are also doing weights, measurements, and ectoparasites on the Laysans we are weighing, so it takes many operations to complete one bird. We found one Laysan with an oozing sore on back, and the skin was eaten away exposing the bones of the pelvic region. Two birds were seen this way yesterday, one was killed as it was almost dead, one being able to look down into the insertion of the humerus in the pelvic girdle. The whole looks gangrenous and smells badly. We collected blood from the sick bird and collected it as a specimen for later autopsy.

After dark we walked to south point and there caught a Glaucous-winged Gull, got a Mckbee card on him, collected reams of lice from the head just behind the eyes and kept him overnight. He regurgitated a rat in the lab, and remains of another were later voided. He was weak and very light, having come in with the other 3 after the big storm. There are 5 Glaucous-winged Gulls now on the island (one was collected and skinned), and



27 Dec. (cont.) 1 of the Kittiwakes (imm.) remains, moving over the island freely. The Glaucus-winged Gulls stay either at S. or N. pt. Booby behavior at night.

28 Dec. Banded the gull and released him at the beach. He is so weak that he can barely stand, even though I forced a rat down him. Dennis and I get some pictures before he flies off and drinks from the lagoon. We put a 737 band on him, but this seems much too large, even though this is what Dept. of Fish and Game recommends. Perhaps his legs are small due to his weakened and thinned condition. Spun down blood, cleaned up lab, worked on Laysans, painting some not marked. Two nests have been destroyed, the eggs broken and contents gone, probably eaten by rats.

We staked out the Booby colony, putting stakes in at 33 foot intervals. Next the colony will be mapped out and platforms designated. The birds have cleared platforms to dance in, and one pair (R13-14) have two platforms, dancing alternately in them. There is much manipulating of nesting material at the present.

Caught a Bristle-thighed Curlew, but he escaped from the lab before I could band him.

Tue.

banded. Midway ←

It was banded

29 December - Dennis and I bled and took measurements and ectoparasites from 8 Laysans - one bird had an extremely worn band which was replaced - the band read ♀ 72 - - - This Laysan, if the 40 means year banded, was banded 24 years ago. At any rate, it is an old bird, and was not bled. There were 4 Glaucus-winged Gulls at south point, including the one unable to fly. One bird regurgitated as I approached - much rat fur and many chelipeds from crabs. The birds can now be approached to within 150' before they fly off. Checked Laysan nests, observed and photographed various displays of the Boobies - in particular Sky-calling and agonistic encounters between R13-14 and R15-16. After dark Dennis and I painted 5 Blue-faced

Boobies in the colony as follows:

Orange 22, ♂, mate of R22	-	697-24516	
Orange 17, ♂, mate of R17	-	737-98231	
Orange 21, ♀, mate of R21	-	667-35030	old Nest #7
Orange 1, unmated ♂	-	667-35057	
Orange 2, unmated ♂	-	737-47001	



29 Dec. (cont) After marking the 5 Boobies, Dennis and I counted Boobies in the colony. There were 90 Blue-faced Boobies in the NAF, plus an Imm. (no. 56), and 26 in the SAF, only 117 in the colony, a considerable drop from Nov.

30 Dec. The activity study occupied all day, with fair weather. In the dawn minutes, there were several Red-foots that would fly over the colony one or two times, settling usually in the spot from which they left. As they flew, many others would Sky-call to them. This was continuous from 0715 until 0800, with usually 10 to 12 birds in the air at any given time. Roost counts failed to disclose any green birds in the roosts - all the painted birds had been painted in the roost, ie. - no discovered changeover. An ad. ♀ Frig. chased and caused another ad. ♀ to regurgitate a small fish on the beach, the booty being promptly recovered by the pursuing bird. Brown Boobies are acting as a flock, and at 0745 17 were feeding together off Sand Island. At 0815 they were all sitting on the Buoy outside the reef or the battered tug. Sand Island, having disappeared in the storm, is back, and at mid-day 48 seals were sitting there. At 1315 an adult and a yng. Brown Booby were feeding in very shallow water in the lagoon, and I could observe the bird underwater. The wings did not open, and after the strike into water in one instance not more than 3' deep, the bird would bounce almost completely out of the water - apparently due to its buoyancy. We painted 21 Red-foots or Frigates after dark, banding 17 of these new. Caught one Glaucus-winged Gull, collected innumerable ectoparasites, and banded him, and also caught the imm. Kittiwake. This bird has a bad but healed gash on the neck, such that the trachea is exposed for over an inch. The bird appears in fine health, much fatter than the Glaucus-winged Gull.

All the Blue-faced Boobies painted last night are now back in their appropriate spots. The orange shows up very well, and is easily distinguished from the red.



31 Dec. 1964 Shore-bird and seal census. We had 80 GR, 105 RT, 1 WT, 2 Sanderlings, 5 Bristle-thighed Curlews, 21 seals. The Laysan nests were 729, a decrease from 841 the previous week, and 832 the week before. The storm here raged from Dec. 16 to 22, so the abandonments occurred a full week after the storm abated. Blackfeet suffered the most, the counts revealing a decrease from 271 nests to 190 - a 30 per cent decrease. Most the the nests lost were on the West beach, from exposure to waves or heavy wind and sand. At least 4 Glaucus-winged gulls were seen this day. Laysans were checked. Booby behavior was observed after dinner.

1 January, 1965 Rested on this first day of the year. Checked the albatross nests, Dennis did some skins, I transcribed notes.

2 January. We began the report for this period, checked the Laysans. Took 9 blood samples and McBee cards on 8 Laysans. Of 8 birds handled randomly, 2 had the back rotting condition. These birds were bled. Another extreme case of the rot was seen and this bird was also bled, then destroyed. The entire thoracic area was exposed, and the scapula hung free. The bird could not use one wing, and was beginning to limp - literally being eaten away by whatever this disease is. Blood from these birds is being labelled as specifically from sick birds in the hopes that the causes of the diseases can be assessed. We have taken one specimen, and have its blood also. This rot is foul smelling, evil looking, completely debilitating, and thoroughly disgusting.

On south point I saw 6 Glaucus-winged Gulls.

After the movie I went out and banded and painted Red 8 Red-footed Boobies. There were no recoveries.

3 January, 1965 While writing the report, I spun down the blood samples taken yesterday, then checked Laysans. On the beach there were two new gulls, a Glaucus Gull, clearly seen, esp. the pink at base of bill, lighter primaries, and light feet, and a Glaucus-winged Gull with an ad. type mantle, although the bird is still mottled below. Transcribed some behavior notes. There were 12 seals on N.Pt.



Mon.

4 Jan. 65 Finally worked out some more mimeo forms - one for the Blue-faced Booby colony check, one for the shorebird and seal census, and another for a daily check on bird populations - particularly for those birds not on island in abundance. Dennis spent the whole day on the Laysan - the skin looks real good. I spent an hour with the Boobies - there was much agonistic behavior, and R9 and 10 are trying to supplant 02 from his platform - this caused a long skirmish between the birds - in one instance the ♂ seized 02 by the neck and tugged, but 02 broke away and continued Head-wagging, eventually getting the platform back. R11 quietly copulated with his mate, I did not see the beginning, but did see the end, it looked as though it may have been a good attempt, it would be good to get some eggs to watch before I leave. There was Sky-calling at 2200 as we were banding Bonins - could it be that some activity goes on through the night?

We banded 54 Bonins tonight - one burrow that I examined went clear out of reach, and the chamber felt as though it was widening out. We caught a Bristle-thighed Curlew, by hand, and banded it. I see now how it gets its name - the feather shafts of the thigh have no barbs, are gossamer-like and shine like a spider web catching the early rays of the sun. These birds are remarkable to handle, lying still on the table as I pour over him for parasites - none found. I could lay him on his back and let go - he would still just lie there. He was released at 2300 and flew off into the dark, with no calling.

5 Jan. Started a new study today to determine who is in the colony and at what time. Each hour on the hour the colony is checked and the ~~activity~~ location of the birds in the colony is noted. Each numbered bird is accounted for throughout the day if in the colony. It is rare for these birds to perch anywhere on the island aside from the colony area, so it is safe to assume that if they are not present they are at sea. We have seen groups of 3 or four birds on Sand Island, but when we did two of the birds were not colony birds at all.

It seems as though the males tend to precede the females in arriving back to the area at night. Single birds were as follows for a 4 hour period:



Sexual structure of single birds in NAF colony,  
5 Jan., 1965

	♂	♀
1400	3	1
1500	7	1
1600	11	2
1700	8	4

This seems to indicate the earlier arrival of the ♂ to their platforms.

There were 5 gulls on S. pt. today - one Glaucus and 4 Glaucus-winged Gulls.

Worked on 6 more Laysans this afternoon - found one with a large hook in the neck, which we removed. Somebody probably fishing for gooneys from a ship somewhere. Found some very nice large black mallophaga in the upper wing coverts of two of the gooneys - the first ones like this we have found. Also some mite-like parasites in the neck. We now have cards on 32, needing 18 more to complete our 50.

Total no. boobies in NAF colony, hourly, from 0800 to 1800.

73; 12; 3; 7; 8; 9; 12; 19; 37; 80; 85.

6 Jan. We had an afternoon full of rain, I worked on a long overdue letter to Dr. Dilger regarding Boobies here on Kure. Also did some paper work. All in all, a rather uneventful day outside the lab.

7 Jan. Working on plant plot figures from Nov., this will consume several rainy afternoons. Dennis working on skins. It clears in the afternoon, so we go out and work with six more Gooneys - one of the birds flinched vigorously as we were bleeding it, and must have ripped the heart, for he died within 2 minutes of being released. Will be made into a skin. I could not find or feel a heart on one bird, so we did not bleed it. So - 5 more blood samples, 6 more McBeed cards with data and lots more nifty ectoparasites. Behavior of boobies neat, with R2 trying to get R22, who is with another male nearby.

8 Jan. This day was spent on the N. tower, all day activity count. One RED Frigate was seen over W. beach, and one Red RFB flew and landed in the N. roost. The general impression one gets, however, is that there is a very limited amount of roost exchange in these two



8 Jan. (cont.) species, although there is no where near the site constancy that is found in Blue-faced Boobies. Behavior this PM revealed both R2 and the ♂ of R22 Sky-calling simultaneously to get the attentions of R22. The unpainted male (painted 04 tonight) is definately winning out, although R22 sits with R2 if the other bird is not around.

Painted all the Boobies we could catch fresh, and gave two new birds numbers as follows:

03 - the Sky-callin ♂ at XO	697-24509
04 - the ♂ with R22	667-35059

Both birds were recognized merely by the positions they were in, relative to colony stakes and other birds. In genral, all the birds were in the same spots they occupied at dusk, and have been occupying for the last week. One Laysan was found dead next to study nest 33, and was collected.

9 Jan. '65 The shore bird and seal census occupied 4 hours, from 1000 to 1400. The numbers this week were consistent with those found for last week - 732 Laysan nests is a variance of 3 nests. No Sanderlings were seen, 71 Golden Plover, 125 Ruddy Turnstones, 11 Wandering Tattlers - a high figure. Five Glaucus-winged Gulls and 1 Glaucus Gull were seen. Most interesting were the figures on Laysan problems and their back-rot disease. 13 Ad. Laysans, 3 on nests, were found with the disease in various stages. It is easy to tell an incubating bird in this condition, as there is a mass of feathers surrounding the nest, where they were preened out or fell out as the skin rotted away from underneath. Walkers in advanced stages can also be spotted, as they limp, and often one or both wings droops down. This disease is as vicious one - not only is the skin attacked, but also all connective tissue, muscle, and probably nervous and vascular tissue in the area of infestation.

ALL 13 SICK LAYSANS WERE FOUND IN THE SAF - none were seen elsewhere. Also found, IN THE SAF, were 8 dead Laysans; those not badly decomposed showed the familiar back rotting, and the others, can be assumed, died for the same reason.

Black-footed Albatross - nests found this week were 152 in number, a drop from 190 last week.



No Black-feet have been seen with the back-rot; indeed the Laysans are the only ones that are afflicted as far as we can tell.

Spent an hour with the Boobies this evening, they are all in normal position, although much more alert and scared of me than normal, I presume this is because of our painting effort last night. The paint on the head shows up much better now, as we put a thin line down each cheek of the bird. Those flying overhead can now be read with much facility.

Dave, Dennis, and I went skin diving in the afternoon. Although the water was cold, we managed a half-four of so, and Dave and I made it to the reef. There are many wrasse, butterfly fish, parrot fish, and lots of others I have not seen - there is a great difference between the fish here and at Johnston.

Sunday

10 Jan., 1965 We bled five birds today - all sick Laysans - two so bad that they had to be killed. Two 10 cc. samples were taken from one bird, he died as a result - he was one of the very sick ones - could barely walk, could not fly, sore covered most of back. The two we killed, plus one that died sometime between 1400 yesterday and 0900 today, were taken to S. pt. and dumped into the sea. The disease must be contagious if all the birds affected are in the same small area. It seems unlikely that we could arrest the disease by disposing of the dead, as the same condition was seen last year in the same area, and is probably firmly entrenched in the soil, if it is some virus or bacterial disease.

11 Jan. Did the Blue-faced Booby hourly colony count today - it rained almost all day long. The rain seems to affect the leaving of the birds, as many more remained in the colony than last time. The hourly numbers are as follows, from 0745, 0900, 1000 . . to 1800.

95; 48; 14; 16; 18; 22; 21; 23; 41; 74; 89.

One bird, B7, a ♂, remained in the colony all day - if he left he would have had to go out, fish, and return within an hour, which seems unlikely in lieu of the length of time away from the colony that the other birds spend. Again, most birds remain in the same



general location within the colony throughout the day.

As the weather was bad, this was a good day, between checks to the Boobies, to remain inside and catch up on paper work - recovery schedules (one Red-footed Booby banded on Kure in Nov. 1963 was found dead on Eastern, Midway on Jan. 4, 1965 - Jim Priest sent the band over on the last plane.) Spun down the blood that we took from sick Laysans yesterday, transcribed some Booby data.

In the evening after chow, I spent an hour observing behavior. Of most interest still is the conflict between R2 and Q4 for the ♀ R22. Q4 still triumphs, but when he is away R2 will m. twigs with R2 and approach his Sky-calling.

Transcribed more data after the movie until about midnight.

12 Jan. In the morning the weather wasn't impressive, so did more recovery forms - those from Midway were finished. We did McBee cards on 7 more Laysans - two to go and we are finished with them, blood from 6 more Laysans - I couldn't find the heart on one bird, so we released him unbled. For the 48 blood samples we have, only 2 birds died accidentally, a 4 per cent mortality. We got 76 Laysan recoveries in the afternoon, and will check the same area tomorrow. Bonin banding by Dennis after dark, I do boobies after dinner, and wander through the SAF at dusk, counting 36 Blue-faced Boobies there.

At 1130 when checking the Laysan nests, I saw a SAF Blue-faced Booby in the NAF colony area - the first time such a mingling of SAF and NAF birds has been seen. At any rate, there is extremely little such mixing.

There was one real sick gooney in SAF this evening, could not fly and could barely walk.

13 Jan. In the morning we do Laysan recoveries in the same area visited yesterday - from lab to area 2, fuel tanks, along N. edge of runway. We saw 57 walkers, of which only 16 were handled yesterday, 41 being new birds to get recoveries from. Thus we have a 72 per cent turn over in walking Laysans in the area in less than 24 hours.

We check on a sick Laysan seen in SAF last night,



13 Jan. (cont). find 2 freshly dead, two very sick, could not get a blood sample so destroy this bird whose entire back is rotted away and is almost too weak to hold up his head.

At 0030 this morning I checked the Blue-faced Boobies. All were asleep when I entered the colony area, but I disturbed the first pair, who called loudly. Those birds within hearing range looked up and called, setting off a chain reaction which swept the entire NAF roost. I painted 3 birds we had missed on the 8th, and noticed that R2 and R22 were together - I could not see O4 around. So R22 has done it again, the polyandrous ♀ sleeps with another male tonight.

Dave showed me how to work in the dark room, so after supper I printed 21 shots of Blue-faced Boobies in various positions, including one incipient Sky-call and mutual gazing. One bird caught holding a twig in the bill.

There were many gulls at south point ~~at~~ today, including the Glaucus Gull.

At 1130 there were 20 seals on N. Pt. Sand Island is almost gone, so more seals are showing up here now.

14 Jan. '65 The activity study occupied most of the day. In the morning most of the boobies were heading out to the north, there was a strong wind from the west. Large numbers of painted Blue-faced Boobies were seen and recorded by number as they flew to and from the colony.

The roost count we use is very inaccurate. I made the 1700 count and saw about 70 Red-footed Boobies. However, 10 minutes after the count had been made the roost was disturbed, and twice that many flew from the Scaevola and 30 remained in the roost - the roost counts must be off by at least 100 per cent.

At 1700 R2 and R22 were together, R20 was alone. Maybe R 2 and 22 will mate, but I'll bet R22 finds another ♂.

Jim Priest came over today to help us until Sunday.



15 Jan., 1965 This morning we went seal tagging, trying out a new method that Dennis thought up - using the canvas weighing sling to throw over the seals. This works out well, one end having been unchained to more readily accomodate the seals and facilitate my putting on the tag of the flailing tail. Jim Pries, who is here, and Dennis sneak up on the seal and throw the paraphernalia over the seal. If they catch it asleep, the beast is pinned by the ever-loving Dennis (who kisses it) and the heavy Jim. Before it knows what is happening I have grabbed the tail, attached the clip, and the seal is then released. There are several advantages to this method over the old wild west lassoing method: 1) the seal is more quickly captured.

- 2) the tail is more easily held, as most of the body is pinned down.
- 3) the seal cannot bite through the canvas, the old method allowed the seal to toss about with resultant danger to the tagger
- 4) the tagged seal does not see the taggers often, and many remain in the area after being tagged.
- 5) the process is less hard on the seal - no constricting or choking ropes around its neck.
- 6) Seals in the area are less disturbed, as we all lie down on top of the seal, and other seals cannot see the captured seal - the sight of a lassoed seal often sent nearby ones scurrying. - we tagged 4, in 15 min., all within 35' of one-another.
- 7) it is easier to release the seal, just get up and the seal kicks off the canvas - no struggling to untie the confusion of knots and nooses around its neck.

Result of the new method - 20 seals tagged in 5 minutes over two hours - the old record was 16 for one day!

This AM Anderson gave us a Bonin he found dead - Jim wanted skinning practice, so he skinned and, with help from Dennis, put up the skin. It looks great. We did paperwork in the rainy afternoon, I got in some Booby research - the wind, rain, and cold have resulted in early sleeping by the boobies - many were asleep at sunset. R2 and R22 are together again - 04 is literally left out in the cold.



16 Jan., 1965 As usual with Saturdays, a good part of the day is taken up with the shorebird and seal census. Jim and I took the beaches - two interesting discoveries.

First, Sand Island is completely gone again - so, seals-seals - seals all over the island, we found 74 of them, 12 of those we banded yesterday (does this 12 of 20, or 60 per cent, reflect that 60 per cent of the seal population is on the island, or that there are 124 seals in the atoll?), and a total of 42 that were tagged.

There was an increase in Sanderling Tattlers - we found 14 of them on the east beach. They were for the most part in the Scaevola near the beach. Is their increase during the present (very) foul weather due to the fact that the reef, on which they feed during the day, is awash with heavy surf, with the consequent only dry area available (remember Sand Is. is gone) ~~is~~ our little paradise. This seems likely but, ~~unfortunately~~ not proveable.

One Black-foot Albatross egg has hatched - both parents are near the nest, one closely brooding the downy white chick. 15 or so other Black-foot nests were spot checked, but all had eggs. Our Black-foot count actually increase by 10 to 162, whereas the Laysan count was about the same. Considering that Dennis and I switch about (alternating beach and interior, and that today Jim Priest was along, our constancy in numbers must reflect that which is here. I think our sampling of such things as shorebirds, nesting Laysans and Blackfeet, adult Blue-faced Boobies and, until recently, Browns, is good. Less good is Red-foot Boobies and Frigates, and worst of all are total island use by Bonins, walker Laysans, Wedge-tails when they are here.

Behavior again today on boobies, again they closed up early.

17 Jan., 1965 Spent the day checking the boobies every hour, the sky was very light at 0700, and most of the boobies had already gone. They had all begun to sleep very early the night before. The moon was full, there were almost no ~~some~~ clouds.

Saw Jim Priest off this P.M. He stayed since Thur,



17 Jan ( cont.) had helped us with many projects.

18 Jan. Mon. I am afraid I have my first cold since last March - it has blowed me down, so I work insided on some paperwork, sleep part of the afternoon. No energy to do much of anything.

19 Jan. Now Dennis also has a cold, we are a sorry pair of bird men. Anyway, Dennis works on Skins, I try to get 1964 banding figured out - what a mess. There are mistakes throughout the progress reports that have been ~~xxxx~~ banded through from July 15, an error of a mere 2,000 bands. Checked Laysans today - very little other fieldwork. The invalids remain inside.

20 Jan. Dennis collected a Herring Gull today, an imm. bird just molting over into adult plumaged. This is the first for the season here, although 3 were collected here last winter - these are vegae, the Siberian race of argentatus. Finally got out to ~~xxx~~ Blue-face d behavior, the cold slowed me down abit. The north roost was checked for nests or eggs of Frigates or RFB, none found. Dennis poked about there. The RFB's on Midway are now nesting - Jim Priest counted 20 eggs there last week.

In the NAF the first Blue-faced Booby egg has appeared. ~~It~~ It is the pair that had been interacting with R278 28, but is unmarked. I will mark them soon, as I think the male of the pair has another female aside from the one with the egg.

21 Jan. The activity study all day again - I took the morning count, Dennis remained until sunset. Most of the RFB went north, with the wind which was from the SW, then headed west from Norht point. Few came back during light times, but those that did came mainly from the ~~north~~ north.

Booby behavior at night, 02 finally got a female to come over to him, but she left to go to the male of the pair with the egg. 01 has a female now - she was on his platform sleeping when I left the area. He did not have one yesterday. Something may very well go on at sea.

Temperature makes news here - a new low record for Kure - 39 degrees. This beats the old mark by 11 degrees. I wouldn't believe it if both our thermometer and



the CG. readings were the same.

Went out last night and marked the two Blue-faced Boobies sitting in the area with the wooden triangle behind the fuel tanks.- study area 2. (SA2) One was a NAF ♀. They were marked as follows:

♂ orange mark on breast	- 737-98171
♀ orange ring around NAF mark	- 697-24529

22 Jan., 1965 This AM I cleaned our little shack - it once again looks quite presentable. I hope it remains this way.

After lunch we took weights, measurements, ectoparasites from 6 Black-feet, blood from 5 of these - the other's heart was too deep. These birds are quite a bit bigger than the Laysans, and not as difficult to work with. They have real neat Mallophaga - large and shiny black - on their wings. These beasts crawl off onto the person holding the bird, but drop off fairly soon. There were some reddish and quite small ectoparasites around the head that were most likely mites.

The Blue-faced Boobies are most active, as far as arrival is concerned, about 1600. I got many picutes - lots of Ol Sky-calling (he lost his ♀), it seemed that tout la monde was Sky-calling as birds poured in - often 5 or 6 in the air over the colony. R19 was with O3 for some time this evening, but R20 got her back after all 3 birds flew off fro about 10 minutes.

Catching rats for autopsy this PM.

Some very interesting light on the Gooney back rot problem. While scouting about for rats, found a 'sick' gooney with rats all about him. I shut out my light and sat down to watch, waiting a few moments before shining the headlight back on the gooney. When I did so, many rats scampered off his back where they had been feeding. Sitting quietly, with the light on, I could see rats approach the live bird, crawl up his back, and feed on the exposed flesh. Every now and then the bird would twitch, turn back to try and get the rats, and then look forward again, the rats eating unperturbed. There must have been 20 of them on the gooney. Do the rats initiate the problem, or merely capitalize on, for them, an opportune meal. I wish I knew, but it appears in lieu of this that the rats are a bigger factor than hitherto supposed.



23 Jan., 1965

~~Sm~~ So much has happened today that it seems like 3 days have gone by. It was the day for Blue-faced Booby hourly check, so I began that at 0700. Never were there fewer than 23 birds in the colony at any time. I caught and painted the ♀ with an egg - 06 now - - 667-35047, and also got the ♂ (697-24517) - 05.

The male, after sitting some time with his mate during the day, left and joined another ♀, even engaging in territorial combat against R27-28 with this new bird. B8 laid an egg today around noon, so we have two Blue-faced eggs in the colony at the present time.

R19 spent some more time with 03, but rejoined R20 after all 3 birds flew about.

The Laysan abandonments in SAF numbered 36 today - this is after Jim Priest had taken 13 of the eggs last weekend. 3 more bands from dead birds were removed by Dave. I saw only two sick birds, but learned a good deal more about them.

1). 4 ~~xi~~ incubating birds were noticed in the NAF, surrounded by a circle of feathers on the ground. Examination showed that these feathers were not fallen out of the bird, but were cut!!! The quills have been cleanly severed, as the one taped in below shows.

2) The backs of two of the birds were examined, and there were ABSOLUTELY NO SORES on them - the stubs of the cut off quills remained firmly in the back of the bird.

3) Rats appear to be the only agent, aside from man and scissors, that could cut the feathers as cleanly as they were cut.

4) The feathers were removed in an area directly anterior to the uropygial gland - an area often stricken by the 'disease'.

5) All the birds mentioned were within 100' of one another - does this suggest that nomadic bands or packs of rats operated within a given area?

6) In broad daylight, a bird was seen with rats crawling all about him. I remained in the area, and the rats crawled over the tail of the live bird and commenced feeding, even though the Laysan grabbed and threw 2 of them off its back. The rats were feeding on live flesh in the area in which the feathers had been removed from the incubating birds. This stricken bird was near the N. end of the runway, well over a dozen rats about him. Pictures were secured of the rats on the back of the



23 Jan. (cont.)

Laysan. Thus it seems that rats are important in this condition - we do not know for sure that they bring it about.

QUESTIONS:

1). Why the localization of the disease to the SAF, with tendencies now for a spread?


2). One Laysan found dead and collected, was subsequently skinned and found to have a small hole,  $3/4$ " in diameter, in its back. Is this truly a disease that caused the death, appearing to our eyes as a small hole (that rats later develop further), or did the bird get bitten there and get infected or die to some non-related cause????

We should have a better indication from autopsy of collected specimens and blood.

Two small pinkish-white eggs, presumably Bonin's, were found on the ground today in widely separated areas - one in NAF and the other near south Point in the Scaevola.

Both of the feathers are from live, healthy-appearing incubating Laysans. The backs of the birds were examined - the stubs remain. No sores present.

NAF



LAYSAN #1

LAYSAN #2



Sunday

24 Jan. Bob Standen arrived this afternoon, we showed him around the island, checked seals as well. There are very few seals on the beach now - Sand Island is back.

While I transcribed data, and read, Bob and Dennis got some Black-foot ~~xxxxxx~~ returns.

I put out 13 traps in an area where the rats were feeding on the live Laysan, then removed the Laysan. Next morning caught 12 rats. Set traps for rat trapping

25 Jan. Rat trapping all morning - we are catching large numbers of new rats - 40 new ones today, out of 119 rats trapped.

Freeze the captured dozen rats for autopsy.

Blue-faced Booby behavior. 01 has not got the new female. 05 is O.E.

Blow out the Bonin eggs, spin down the blood sample from a "sick" Laysan caught yesterday.

26 Jan. Rat trapping AM. Checked Laysans before lunch - 4 eggs were pipped - 3 at 64 days, and one at 63 days. No chick has yet emerged. Some paper work in the afternoon, checked Blue-face Booby behavior after dinner - it was raining, the birds were inactive, so I only stayed 15 minutes. At 1800 I checked the Laysan Albatross from whom the feathers on the preceding page were taken; the rats are continuing their ~~xxxxxx~~ assault. Lets look at this Laysan chronologically:

1). Sat., Jan. 23 - loose feathers all about the Bird, cut off, stubs of the shaft remain in the back of the bird - no opening in the flesh - seems healthy.

2). Sun., Jan. 24 - as above.

3). Tue., Jan 26 - small hole, 1/2" across, in lower back, area from which feathers were removed, slight bleeding, blood stains in region of uropygial gland, bird still on nest. It looks like the rats are wholly responsible for the deaths of these gooneys. Found Fairy Tern, broken wing - FN 20430.

27 Jan. Rat trapping AM. Several rats dead in traps - it was cold (56) last night, and many rats were wet - from their urine.

The Laysan study nests are rapidly changing in character. 9 of the eggs are pipped or cracked - the chick has emerged from ~~xxxxxx~~ two eggs so far. Many pairs are



27 Jan (cont) present at the nest now, and there is much egg calling by both members of a pair. Of the 21 active nests, both birds were present at 3 of them.

After lunch Bob and I went collecting blood, ectoparasites, weights and measurements from Blackfeet - we did 5 birds in 2 hours. Bob was a riot - it was the first time he had handled the birds, and he ended up in some highly interesting positions, the bird holding onto him. A system soon materialized out of the chaos, however, and the last bird took the normal 15 minutes.

We found a Ruddy Turnstone (FN 20421) on the beach, dead.  $\bar{x}$

28 Jan., 1965 The last day of rat trapping, we found a few more dead rats in the traps. , and managed to get many new rats. In the afternoon I checked the Laysan nests - there were five chicks, 6 other eggs were pipped, this is 50 per cent of the study nests that now have pipped eggs or chicks. We may be slightly ahead of the general island population, as we set up the study nests from the first nests we found, so they are slightly ahead of the rest of the island.

Spun down yesterday's blood samples, skinned and stuffed a Ruddy Turnstone today. It came out better than usual, but I still need practice.

Blue-faced Booby behavior not done this afternoon - I had to finish up the Turnstone after supper.

B8 has now two eggs - only one yesterday, so the second must have come today or late last night.

Saw the old-time Laysan again today in the same area where we rebanded him in Dec. 29, 1964. He was walking in the colony. (~~See Dec. 29~~)

A Red-tailed Tropicbird was found in the Scaevola on a cleared scrape of ground. His band was 605-12677, an adult with the pink tinge to the feathers. He flew off immediately upon release. I have seen RTTBs land in the Scaevola so far this winter only one other time, that was the January 21 Activity Count from the radar tower.

An Adult ♂ Frigate was making continued forays into the NAF gathering twigs and other nesting material - so nesting is underway.



29 Jan. The activity count lasted all day - Standen got the wettest watch, but it cleared in the afternoon and was very warm and clear - a real pleasure. Of prominence were the forays, repeated again and again, of a ♂ Frigate from the N. roost into the central plain ~~again~~ for twigs. It seemed the bird would generally hover over Solanum clones and rip out large twigs of the plant - it looked like living strands were broken off.

The birds generally came back in flocks of from 3 to 8 birds, containing both RBB and Blue-faced Boobies, the flocks coming in from the NW and breaking up over N. pt. the BFB going to the NAF and the RFB landing in the ~~central-west~~ north roost.

One study bird, the ♂ Laysan on nest 50, was in perfect health yesterday. Today he was unable to stand, and a hole about 6" x 7" was eaten out of his back. I destroyed the bird, and his egg is being kept under a lamp in the lab, although it will probably not hatch. The rats work quickly.

After the great movie (Sex and the Single Girl) we all had to go out for exercise, so Dennis and Bob banded RFB and Frigates, I worked on Bonins and counted the Blue-faced Boobies and Brown Boobies ~~and~~ on the island. There were few Bonins about, only 19 banded and 9 returns in 3 hours of walking about.

The numbers of boobies were low - 114 Blue-faced and 22 Browns - the latter consists of 10 Imm.

While banding Bonins I found an injured fairy Tern, an injured Bonin, and a weak Golden Plover. The Fairy Tern is being cared for in the lab, the Bonin was destroyed and kept for a skin, and the Plover was banded.

30 Jan. The shorebird and seal census was carried on ~~today~~ today. Dennis had the interior, Bob and I took the beaches. An attempt to assay number of Albatross nests hatched revealed some interesting things - hatchin over the island is far from uniform. At N. pt. 33 per cent (1 of 3 nests there) were hatched, 20 ~~+~~ 4 per cent hatch in all the rest of the beaches and the runway, whereas only 12 per cent hatched in the interior (both antenna fields). DOES THE activity of the Black-feet on the beaches accelerate egg laying there in the Laysans? Anyway, the beaches are ahead of the rest of the island in eggs hatched.



The total hatch of the Laysans is 19 per cent, or about 120 of the 631 nests.

64 per cent of the Blackfeet are now on chicks, with 40 per cent hatched on N. pt, 67 per cent on west beach. Shorebirds are way down - only 37 GP and 58 RT. Blue-faced Booby behavior in the PM after chow.

Jan 31, 1965 Checked the Blue-faced Boobies every hour today. the numbers in the colony are lower at night, but higher during the day. 69 were found at 0720, 74 at 1850. The lowest number were found at 1000 hours - 21.

The female Bl6 is behaving strangely, sits in the same spot hour after hour, not standing but sitting. No egg, but since these notes are written a day late I can say that she laid an egg sometime during the night, as there is one there tomorrow.

1 Feb. Bl5 is on an egg in the same area that Bl6 was sitting all day yesterday. She laid the egg in the spot she stayed in all day. Almost all of today was taken up with report writing - an extra long report that covers everything from house mice to weather. We must find a way to census amount of Bonin Is. Petrel active burrows with eggs. Two eggs have been found on the ground, but we cannot check burrows without destroying them.

2 Feb. Finished off all my recovery forms this A.M. Cheded Laysan nests and Blue-faced Boobies at 1400, at that time all female boobies on eggs. At 1830, after doing some behavioral observations, noticed that all the nests were attended by males - each had changed mates on the eggs.

I found an injured and emaciated Imm. Frigate today - brought him back to the lab for bleeding. Won another dollar from Dennis - he bet I couldn't find the heart and draw 10 cc. of blood from the injured bird - got 11 cc. on the first try. The heart was located about 1 inch to one side of the center of the sternum, and almost 1 1/2 inches deep. The bird was dispatched and is now proudly wearing tag FN 20427. One wing was damaged in the carpal area. In carrying him back I picked up quite a load of Mallophaga - almost 50 of them on my tee shirt. I have never seen a bird - even among Frigates - so loaded with



2 Feb. (cont.) ectoparasites. The head and back were literally alive with them.

The molt on this bird was interesting - a young of the year with red tipped head feathers - molting on the head - the new feathers coming in were also red tipped. I thought this post juvenal molt was into pure white head feathers, but apparently not.

Seeing many "♀" looking Frigates - black heads, white breasts, in which the breast is mottled with black, and a prominent red Gular pouch is showing. Apparently the head of the male frigates turns black prior to the belly molt. One of these males, in Scaevola near SE beach, had an inflated pouch.

Went after Bonins tonight as Dennis and Bob went after Red-foots. The Bonins were thick, 30 birds in SA2 alone - 18 of which were new. When will that spot be banded to completion? Never, we still have yet to ~~have~~ find more than about 60 per cent banded after all this time.

The SA2 ♂ is alone tonight - his ♀, originally from NAF, has now been seen on two occasions in SAF - she really gets around.

3 Feb. It was the best day I've seen on Kure, no wind, no clouds, warm and clear. Part of the morning I spent working up some booby data. In the afternoon did the Laysans and looked about to see what could be found - another RTTB was found that had a 605 band on it. The Blue-faced Booby behavior after supper was poor - the dictet failed to record, so many observations were lost.

After chow we had one of those things that we have all heard about - a tidal wave alert. We spent almost three hours on the beach before we could come down. Fortunately it was clear, although there was dew do dampen things down abit. This quake was just south of Attu in the far western Aleutians, and registered 7.5 at Cal Tech, closer to 8.0 in Japan, which is really huge. The swell may have extended as far as 5' up our beach.



4 Feb. Activity study all day, radar tower. Check the Laysans. There is very little action in the roost.

5 Feb. We worked on some Black-feet in the afternoon, doing six birds - blood samples, parasites, McBee info. It still takes about 15 minutes per bird.

Band Bonin's this evening, band 16 new to the area, 10 returns, and 1 egg found on the ground.

6 Feb. Shore-bird and seal census. The find of the day was a White-tailed Tropicbird cruising over SE beach. I also found, after weasel told me, a Glaucus Gull, dead and rotted partially, on the beach. I plucked it and it will make a skeleton. FN 20429. The Fairy Tern we had, that got away yesterday, I found dead in the Scaevola, in usable condition. We also found a Golden Plover banded only a week or so ago.

7 more Laysans were found dead - all rats, and two were in bad shape - one had to be destroyed. In two cases both an adult bird and its chick had been eaten. The siege of the rats continues.

Spun down blood from yesterday's Black-feet (K63-68).

About 50-60 per cent of the Laysan Nests have chicks.

7 Feb. In the morning we went about in the area surrounding the central roost and got returns on the Laysans - we did about 150 birds. Birds on the nest are being painted with green stripe across the breast, those ~~with~~ walkers are being painted with a small green spot on the breast. Similar marks are being done in the SAF, although the paint used there is orange. Dennis and Bob went out and did more Laysans - in the SAF, after dark. I banded some Bonins, but they were extremely scarce - I found only 17 birds in all of SA2, SAF, and behind the fuel tanks. Only 9 needed bands. Time was 1000-1100.

Did Blue-faced Booby behavior and got some interesting interactions with R19-20-23 and 03. There is a definite aversion of the head in all interactions between pairs, while antagonistic interactions make more use of the bill directed at the opponent.

Ex. A Hd-tu w. by a male around his mate, almost without exception, features a bowing of the head down on the side of the breast away from the mate. Twigs are m. on the side away from the female, and then placed in



7 Feb. (cont.) front of her. Perhaps the bowing of the head-tucked walk itself functions in hiding the bill.

Hd-w features a swinging of the head from side to side through an arc the center of which is directed at the antagonist. However, just prior to attack the bill, I think, is directed at the antagonist. Could it be that Hd-w represents a compromise in the aggressive and appeasement moods of the displaying bird as the direction at the opponent is aggressive, while the swinging away is appeasing. To be looked for in further work.

8 Feb. A word about the overall pattern of Laysan returns and banding should be mentioned. All banded and returns are being painted - all those found on chicks are given a horizontal line across the upper breast - all those ~~xx~~ that are walkers are given a spot on the breast. The color schema for the island is as follows:

Blue - to be used on birds on NE and NW beach only.

Green - birds of central roost and its extensions - SW beach, north side of runway, and SA2.

Orange - birds of N roost, NAF, and SAF.

Copper Kettle - birds S. of runway, inc. SE beach.

This AM went out and got returns on all birds we could find S. of runway - Copper Kettle territory. We marked 165 birds. This brings the total so far this period to 643 Laysan returns, 201 banded. Dennis and Bob have accounted for most of this.

I managed to crank out another batch of recovery forms - we are getting about 10-15 Laysans found dead every week. The rats are busy. I found another young Laysan killed by the rats. The young that I moved from nest 33 to nest 29 is thriving this PM. The young was fat and well fed - like a rubber balloon filled with oil. Rereading Feb. 7 notes I see I did not include this info. On Feb. 7 nest 33 was abandoned by the male who had been on the nest since January 9, 1965. The female had not been to the nest in that time, and by Feb. 7 the male was uneasy. He left the chick, then 11 days old, and it was already thin when I found it in the nest looking all about. The chick was attended at 1800 the 6th, so was probably not abandoned until the

Found LAYSAN 737-72347, Yellowhead - Fishers?



8 Feb. (cont.) morning of the 7th, as I doubt an unattended chick could survive the rats throughout the night. I first found him 1600, and returned at 1830, just prior to dark. As it was still unattended, I wanted to move him. Nest 29 still contained an egg, but it was way overdue - 75 days along on the 7th. It proved to be a non-fertile egg, so I removed the egg and put chick 33, 11 days old, under the incubating ♀ 29. The chick was immediately accepted, and the ♀ settled down on it as though it were her own. I remained about 5 minutes, but there was no feeding of the rather thin chick. However, this AM the chick was fat and full of oil, so it looks as though it is being fed by its foster parent. The ♂ 29 has not yet returned. Acceptance of an 11 day chick by a bird on an egg seems to defy all the traditional information we have about chick acceptance.

Blue-faced Booby behavior this PM - in a slight drizzle. There was a good bit of fighting between 06, B12, R23, R27-28 - all around 05 and his egg, 06 driving off all comers.

Stuffed a Bonin after chow - looks pretty good.



9 Feb. Spent a good bit of time with the Laysans this Am. and after dark. The NAF and SAF were done, as well as SW beach and central roost. Albatross checked, the foster chick at nest 29 is doing well. Another abandoned chick was found and given to nest 38, the ♀ on the nest accepted it without any unusual behavior. The egg from 38 was removed and found to be rotten.

It was a good night for Bonins, so while the three of us checked Laysans in NAF and SAF we banded Bonins - I also banded them in SA2 - we found 25 unbanded birds. We may be finally getting on top of the Bonins there - of 16 birds found there only 5 needed bands. This is after several months of heavy and continual banding in the area.

Checked NAF Blue-faced Boobies after dark to compare at-night count with the next day - found 2 new nests, both attended by the female. A House Mouse caught.

10 Feb. Did the all day Blue-faced Booby colony count. There were two new ♀♀ marked while on eggs -

010 - (♀ 737-45121) and

012 - (♀ 667-35067)

010 left the nest when marked at 1300 and did not return until 1830. 012 returned immediately to the egg, which had been numbered with magic marker. The bird placed the bill down as though to move the egg back under itself, then immediately straightened out and shook its head, as though in response to the adverse smell of the marking ink. This was repeated at regular intervals of about 20-30 secs. for the few minutes that we remained with her. We left so that she would not abandon the egg as 010 had done. I put up a Fairy Tern (FN 20424) that is a little shabby around the neck. Skinning is becoming easier - I just need more practice.

The three of us got some more returns on Laysans on the SE of runway area -

It appears that there is some tendency for ♂ Blue-faced boobies to incubate at night, and for females to remain off the nest during the day - not an absolute thing, however. At 2200 last night 05 and 07, as well as B15, were on their respective eggs. By 0900 today 06 and B16 were on their eggs, and at 1000 08 as well - all three females. By 1830 that night all the males were back on the eggs. This must be further checked.

Also - caught A  
Mus musculus FN 20430



Laysans.

72201-27, returns,

SAF

11 Feb.

In the morning at 0900 checked the nests of Blue-faced Boobies, found 4 females, 2 males on the eggs. At 1600 there had been only one change - from 06 to 05. Saw the old walker Laysan with hatched neck again today, first time since about two weeks ago. This is old 40 ---- on the band we replaced.

~~Forgot to mention~~

Spent part of the morning cleaning up the lab, getting out the Laysan skins for Dennis to take with him, and clearing up last minute details re. his departure. He is rather anxious to get home. Alan Anderson did not arrive. ~~xxxx~~ So Bob and I will have plenty to do until he arrives.

After the movie Bob and I go out and get returns and band 85 more Laysans. We should try for a hundred every night. Caught another Mus musculus.

12 Feb. Activity count all day. Ix have the morning session, and find not very many birds in the colony at 0720 - about 100 Red-foots and 180 Frigates. The number of Frigates remains stable around 200 all morning. The number of Tropicbirds increases in the morning, and at 1300 there are about 8 birds over the north roos. Many Frigates are displaying with fully inflated gular pouches.

13 Feb. The shorebird and seal census occupied most of the day, the scooter has broken down so the interior was done on foot. There is a continued drop in the no. of Albatross nests - only 535 Laysans now compared to 577 last week. Of these 80 per cent have hatched, or 20 per cent more than last week. Blackfoot hatch now is at 92 per cent - the few remaining probably have infertile eggs. The shorebird population remains constant with 46 GP and 72 RT being sighted.

The Coast Guard took the boat out to Sand Is. and beyond, and reported a seal pup there. We will try to get out to it to tag it and if need be, the mother. This is 5 days before the first noticed arrival last year.



Sun.

14 Feb. Bob, with the help of the crew, fixed the scooter, so we have wheels again. We learned yesterday that a seal pup had been born on Sand Island, so we set out this morning to tag, weigh, and measure it, but a squall and subsequent bad weather forced us back. We didn't get started anyhow, as the outboard motor refused to work. The storm precluded the arrival of the plane, so as yet still no Anderson.

Chips told us this afternoon that a seal pup is at south point, born this AM most likely; there were no pups ~~in~~ yesterday on the island. Bob and I weigh and measure the pure black pup - ~~xxxx~~ tagged the mother no. 371, will tag the pup 372 the next time we work with it. The ~~x~~ ~~xxx~~ mensural data on the pup are as follows: Wt - 35 lbs; TL 43 inches; T 2.5"; FF 9"; HF 8.5" long x 11" wide (stretched); Girth 25". The entire body was velvet black, iris dark brown, vibrissae black and curled, Claws, front flippers only were 3/4", no teeth, eyes open, 5" umbilicus, bleated in response to the grunts of the mother and capable of limited directional movement.

Pup measured at 1500, at 1800 had moved 40' from spot where left, with ♀, attempting to nurse. The placenta still remained at this time, and was being fed upon by approximately 15 Ruddy Turnstones.

Two gulls, presumably *Glaucus*, flew over S. Pt., the first we have seen since 2 Feb.

~~Maxidix~~

15 Feb. Lots happened today, mainly a pile of news from Midway - both Dr. Fisher and Chan have reported Kure Albatross on Midway. One bird we found was a bird marked on Eastern-Midway by Fisher. - 737-72347. Fisher and Priest report seeing a bird with a green slash on the breast - a bird marked here within the last two weeks while ON EGG. They also saw 737-92167 and 737-92172, both banded Green-Kure in Feb. '64. ~~xxxxxxx~~ Chan ~~xxx~~ saw the Bristle-thighed Curlew with an orange streamer at Midway, as well as Black-footed Albatross 737-92698 seen on Eastern Is. on Feb. 8, '65 - it was banded Kure on Feb. 5 '65, in the evening. Chan also has a nester Black-foot on Sand-Midway, 737-93993, that was banded here 17 Jan. '64



15 Feb (cont.) Bob and I got all the necessary equipment out to restake the beaches, and then the plane bearing Alan arrived, so, after fond farewells to Paul Daly, the three of us set off and restaked from the dock to N. pt., checking Laysans and Black-feet as we went. We are painting all those birds found along that stretch of beach blue - Dr. Fisher is not using any color code on the breast of his birds, so our code is OK to use. The avoidance of confusion and misunderstanding such as occurred last year is much to be desired. Also, by informing Fisher of our schema, he can look for our marked birds on Midway - he has already sighted one of them. Communication with him seems firmly established now - I hope we do not run into trouble again.

Checked the Laysans as usual, & far none of the study chicks have been destroyed, but we did find four dead young in their nests. Rats had gotten three of these, the fourth has been saved and will be skinned.

At 1100 we walked through NAF and noticed R4 standing on a platform. At 1600 she was on an egg, so we have laying time down to within a few hours on her. That makes 7 study nests in the NAF to date.

Blue-faced booby behavior after chow.

Another Mus musculus was caught today - that brings this periods total to 5. It will be made into a round skin.

Seal 371 and pup doing fine, same position on beach - at K44.

16 Feb. A large part of the day was spent typing up the report. However, Laysans and Blue-faced Boobies were checked - two more booby nests this period, inc. one that had two eggs, one of which was soft and broken. It appears that the two were laid in quick succession, one of them not hard enough to endure the weight of the incubating ♀; perhaps it broke as it was laid.

Bob and Alan finished staking the beach - SW beach is now all done, and the island is once again ringed with red stakes.

I tagged the seal pup 372 today, no problem with it - it seems healthy and is attended voraciously by the mother.

Blue-faced Booby behavior after chow, then after the lousy flick we get returns and band in central roost



16 Feb. (cont) area. We handled about 100-110 birds, mainly Laysans, in addition we banded some Bonins. Got a return on one Bonin with an ~~mx~~ egg in the oviduct - 753-33861. Jim Priest on Midway is finding now many Bonin's with eggs. In SA2 handled 11 Bonins - sad news - only 4 had been previously banded. Is there no end to the number of birds using the area.

17 Feb. Today I checked the Blue-faced Booby colony every hour. There were few birds early in the day, but the number throughout the day was high - there are now 9 nests, one of which (4) has been abandoned. The number of males vs. ♀ incubating did not seem to change appreciably during the day and night. There were 3 ♀ and 5♀ at ~~10~~ 0716, 4♀ and 4 ♂ at 1200 and 1700, and 5♂ and 3 ♀ from 1900 to 2300. Slight increase in the males on eggs at night. The locations and individuals present at 2300 were almost identical to those of 1900, almost no change at all - 7 new individuals had come into the colony.

~~The number of birds~~ Alan put metal numbers on the last of the blank beach stakes, so that is all done. At 1600 on Bob and Alan counted the ratio of marked to unmarked Laysans in the Central Roost area. They found 86 marked birds and 154 unmarked, or 36 per cent marked. We have marked a total of 892 birds in the central roost, so this gives us a minimum of 2500 birds using that area. There is a tremendous turnover rate, and although perhaps 300-400 birds will use the area at a given time, a great many more, over time, come in.

We weighed and measured the seal pup again, it has ~~18 Feb~~ grown slightly, with new measurements as follows: Wt. 40; TL 45"; T 2 3/4"; FF 9"; HF 8 1/2" long x 12" wide (stretched); G 27". There were no teeth, and the umbilicus has sloughed off. The young crawls well and bleats in response to the mother, who follows us wherever we take the young.

18 Feb. Activity study all day. It should be called an inactivity study again, as there was almost nothing happening, and the latter 1/2 of the day it rained and rained. ~~At~~ .21" by 1800, and much more during the night. At 0700 there were 19 RFB and 5 Frig. in the roost. Things deteriorated all day, most of the time

Total seen: 276



18 Feb. (cont.) there were no RFB in the roost, and the rain came down. At 1850 I made the last roost count - there were 27 RFB (mostly by SE beach) and 14 Frigates in the roost, and 24 Frigates still soaring over SE beach where they had been all day.

Frigates were chasing RTTB today, on one occasion an Ad. ♀ chased a RTTB so vigorously that it hit the water and bounced about 10-15' before stopping. The Frigate picked something up off the water and flew off.

It was raining harder after dark, so we stayed in this evening.

We got letters from both Bill and Chuck, both urging more granting agency type action - so, a big push will get underway for more blood and ectoparasites. We are and have been operating at full capacity re. Berleze - 3/ day is all we have equipment for.

19 Feb. Today we made a big push to band at least 100 Laysans - we got 114 ~~on the beach~~, and got returns on another ~~300~~ birds. Boy am I tired; we will continue to work with Laysans until a reasonable percentage of the birds here have been handled. There are still a good 60-70 per cent unmarked bird on the island.

Alan and I bled 25 Laysans, one of which was hung up on ~~xxx~~ guy wires and lost a wing. We took ectoparasites the new way (vials according to location) and dispatched the bird. He was too damaged - we never found the wing - to be of any further use.

After chow I did Blue-faced Booby behavior, and Bob and Alan set the traps for our autopsy rats. ~~Rain Threatens.~~

20 Feb. Shorebird and seals census occupied a good portion of the day - we all managed to finish prior to the rain which came and continued on into the night. We counted 466 Laysans with active nests, or a drop of 69 from the previous week. A total of 92 per cent of these had chicks (427 roughly), an increase from 80 per cent from last week.

There was an increase from 1 Wandering Tattler to 10 this week. This was their first week in the last three when the surf has been breaking over the reef, and the high numbers of Tattlers is most likely due to the inaccessibility of the reef to them. We, in fun, predicted before we did the count that a high number of Tattlers would be found. Alan did the beach, and his ~~th~~



Also - 1 RTTB seen - on egg.

20 Feb. (cont.) tally well with the high counts on this species that the rest of us have made during the winter.

Laysan mixing is minimal. On all the island, with over 2,000 Laysans now marked, we saw only 2 birds in the area in which they were not marked. One Green bird, from Central roos, was found in runway area along SE beach (not far from Central roost area), and one orange marked bird was found in the central roost.

Large numbers of Frigates, still mostly males, are gathering nesting materials, still Solanum and Tribulus, from the central plain - all in NAF. The plants seized are generally living. 6 birds were seen gathering twigs, and at least 16 nests have been at least partially constructed in the ~~central~~ north roost. No nests were seen in the central roost.

Four new dead Laysans were found in the SAF, none elsewhere. There are now 18 Blue-faced Booby nests, 6 in the SAF and 12 in the NAF. The Brown Booby chick has been destroyed and eaten.

Two gulls were seen during the count, one at S. pt. and one at N.pt. They are thought to be Glaucous Gulls. Counts on the other shorebirds are as follows: GP - 47; RT - 81; S - 4; BTC - 4. Two Fairy Terns were seen. There were 35 seals on the island.

It rained all afternoon and into the evening, so work in the lab was done. 15 autopsy rats collected.

Sunday

21 Feb. Pouring rain all daylight hours and on into the night. Due to the bad weather, we decide not to set rat traps for this evening. The storm looks as though it will persist. We got all caught up on data, everything from notebooks is now recorded.

22 Feb. The big day of inventory has struck - it was raining hard all morning, misting in the afternoon. Toute le monde is checked out, shelves and trunks are labelled, and we have a rough idea of what is here. Wirtz has been thorough - there is an abundance of almost everything.

We went out this afternoon into the mist for Laysan returns and banding. We found, while in the process, another RTTB on an egg - this makes two nests to date. We handled 186 birds, 61 of which required bands, the other 125 we got returns from. These were all in the



22 Feb. (cont.) central roost, and boosts our total number handled there alone to 1318 birds. We still find a good percentage of the birds there unmarked.

After supper we set the rat traps. I sure hope that the rain will stop, and that tomorrow will dawn clear for the trapping.

Most of the Laysan study nests are now unattended. There were no new Blue-faced Booby nests in the NAF. We found another antenna casualty today - a one-winged Bonin. We found ~~was~~ one yesterday, as well as A Laysan that was knocked silly - probably damage to the cerebellum the bird's balance was shot, the hind legs were paralyzed, and it could make only uncoordinated movements of the wings. The bird was extremely accurate in pecking at intruders, however. He was bled, as was one Bonin. We could not draw blood from the wounded Bonins with the small hypodermic needles; the 1 1/2" needle finally succeeded in getting 5 cc. from one of the birds.

23 Feb. Today the morning and an hour and a half after lunch was spent catching and working with the rats - rat trapping has hit us again. Most of the animals handled appeared to be coming into or already arrived into breeding condition. Almost all the males had well developed cremasters and testes, and quite a few had enlarged cauda epididymis. There seemed to be a dearth of mites - very few of the animals handled had mites 1, and mites two were not at all abundant.

Almost all the females had perforate vulvas, and of those most were swollen and purplish in color. One female had a sperm plug across the vulva, one was lactating, and 3 had embryos that could be felt within. It looks like the trysting season is upon the rat population. They do not look so thin at the present time either. If more food is becoming available to them, we should see a decrease in the number of Laysan deaths in the antenna fields. Only 98 rats were caught today, of which 20 were new.

Before dinner Bob censused the painted vs. unpainted Laysans in the Central roost, and found that 169 out of 261, or 64.8 per cent, of the birds there have been painted. We have painted 1318 birds there, so a simple calculation says that there should be about 2028 birds



23 Feb. (cont.) in the area. This is a drop of about 500 from our calculation earlier. Perhaps reflected in the figures is the high number of birds that had been handled yesterday, birds ~~xxx~~ that may still have been hanging around the area.

After dinner I checked the NAF and SAF for the same thing, and found 71 of 232 birds counted painted. This is 31 per cent of those birds present. We have painted to date 817 birds in the area; ~~xxx~~ calculation thus provides us with a figure of at least 2700 birds using the area. If these figures are anywhere near accurate, there may be 5,000 birds using the two areas, plus those S. of the runway and those ringing the north beach.

I saw old Laysan in the same part of the NAF today - the location he has always been in when seen. This is the bird with the checkerboard neck, caught originally in Dec. with an old worn band.

Bob and Alan chased down more Laysans in SAF and NAF this evening, and banded an additional 61 birds.

Rat trapping will continue tomorrow. I hope that I don't get bitten again.

We saw three Fairy Terns flying over the NAF during the trapping. One injured Fairy Tern was found, its wing ripped off. It could not be bled.

24 Feb. Rat trapping all Am., finished by 1135. We only caught 98 rats, and of these 17 were new, we are now up to C143 on the new rats. There were very few in the A-B area, more as we progressed East. The cloud cover we have been having finally broke, and the last hour was in clear, warm weather for a change.

After lunch we split up, Bob banding in the Central Roost, Alan and I getting blood samples from 8 Black-feet, McBee card data on 6 of them. We are collecting ectoparasites the new way - a vial for each main body region - head, body, wing. ~~Bob~~ Alan and I do the 1st seal pup - it has grown to the following dimensions: Wt: 53 lbs; TL (snout to tail tip) 43" - (snout to flipper tip) 50"; T 3"; FF 9"; HF 8.5" inside, 10" outside; width, stretched 14"; Girth 33". Still no teeth. A new seal pup, born this AM, was found this afternoon, measured, weighed, and tagged No. 373. It is larger (w<sup>n</sup>) than the 1st pup was at birth, as follows:  
Wt. 37 lbs; TL (to tail tip) 40"; FF 9.5"; HF inside 9.5



24 Feb. (cnot) HF outside 9.5" Width (stretched 13"); T 2.5"; Girth 23"; eyes open, iris brown; small nails - hind flipper, 3/4" nails on FF; curly black vibrissae; umbilicus 17" long, major portion only 4"; bleating, attempted to bite when we tried to stretch him out for weighing; no teeth. Very good at crawling. Vulva of ♀ (232) was bleeding when first seen by Van Bolt at about 1500. We didn't weigh him until 1800, after chow. The afterbirth was dry on the outside, but still moist within.

While setting rat traps from 1830 until dark, we found two more antenna casualties - both Fairy Terns, one dead. The birds were not there this AM.

There has been a great increase in the number of RTTBs today - we ~~xxx~~ 60 in the air at one time, and many are on the ground. After dark we hear many, perhaps 6 or even more, Sooty Terns calling. They will begin descending upon the island soon.

More Laysan banding and returns after dark.

25 Feb. Rat trapping in the AM. While Alan and I did rats, Bob went out and did some more Laysans. We got 100 rats, but only 4 new ones - ie. C numbered rats. There were 2 double captures today!

Found one Bonin and 1 Frigate antenna kill today, the Frigate was an adult male in breeding condition, banded here in late 1963 (737-45411).

The ~~xxxx~~ came today and I learned that I should leave today. There is too much unfinished business to attend to, so I will stay until Sunday.

Three Fairy Terns flew about us in the NAF today - calling and hovering overhead - the first time they have done this. There was a new (the 3rd) RTTB nest found by Bob.

After setting rat traps, we band more Laysans and get many more recoveries. We are counting per centage marked vs. unmarked Laysans in the Central Roost, and the last two population estimates for that area, based on total number marked, has come out 2230 ± 10 the last two days. We are closing in on the total population in that area. To date we have 1533 birds handled there.



26 Feb. Rat trapping all morning. Alan and I start at 0900 and just finish by lunch at 1200. We catch 119 rats, 11 of them unmarked, a total of 30 of them were not previously caught.

We are all exhausted after five or six 17 hour days, so we take a quick nap after lunch. About 1500 Bob and I attempt to get Black-feet ectoparasites and blood. Bob earns for himself the coveted Willet award for a new ornithological first. While holding a bird while I went for pliers, he strangled it to death. Not knowing it was dead he banded it. Alas and alack, we had to put the on another bird. Bleeding a bird if it is freshly dead does work - I got 10 cc. easily from the dead Blackfoot, who was immediately skinned and is now FN 20441.

Meanwhile, Alan searches for Laysans to band, but draws a blank in that quarter also - there is a very conspicuous absence of Laysans from the island. After chow we all run about getting Berlezes, weather, boobies, etc. I show Alan around the Booby and Laysan Albatross study areas - he will do that from now on. After a good flick we attempt once again to take a chink out of the goal of 1001 Laysans banded this month, but find almost no birds about. All the regular locations are deserted, for no apparent reason - our disturbance has not been as widespread as is the lack of Laysans - it must be some weather factor.

I had found a Bonin Is. Petrel after chow, so I do a McBee on it when we dribble in from banding - about 2400. It is ~~0010~~ 0100 by the time I hit the hay.

27 Feb. We attempt and get away with the impossible today - we do both the activity count and the shore-bird and seal census simultaneously. It is easy with the 3 of us, one on the tower and ~~one~~ two doing the count. I find 5 RTTB that I band and bleed, giving us a small series of blood from another species. All the results haven't been added yet for shorebirds, etc., but it looks as though all the Laysans that are going to hatch have done so.

Activity - RFB building nests like mad, many birds landing in the NAF and pulling for twigs at the Tribulus and Solanum, which is taking a beating, what with Frig, Blue-faced Boobs, and RFB all pulling at it. The RFBs are great pirates, stealing twigs from one-anothers bills



27 Feb. (cont). as they attempt to make it to their nest. On one occasion I saw a twig exchange 'hands' 5 times before one bird finally managed to land with it. At 1855 Roost Counts were made both towers, as follows:

N. Tower	- 154 RFB, 200 Frig.
R. Tower	<u>120 RFB, 17 Frig.</u>
Total	274      217.

This is a seen number, probably twice that number are in the roosts, or at least 400-~~450~~500 RFB and about 400 Frig. We must add a cirrigenda to last report - there were not 800 RFB in the roosts or about the island.

Brown Boobies remain hard to count - there are probb. still about 75 Brown Boobies on the island, but they are dispersed all about, roost on the reef & the buoy, and rocks, even on Sand Is., that a proper evaluation is difficult. The Blue-faced Booby number remains consistent.

On two successive days 3 Fairy Terns have been seen flying about the island. Today courtship flights by one pair were conspicuous, synchronized, but erratic, flights of the two over the N. Roost. We also had a tremendous increase in the RTTB pop - Alan had ~~131~~<sup>131</sup> in the air this afternoon. There were many more on the ground - so at least 200 birds, probb. a good deal more, were on the island today. We banded and bled five of them. They will continue to get easier to find and handle. Alan grabbed and I ~~grabbed~~ bled 5 SAV Blue-faced Boobies this afternoon after dinner. They gave me difficulty - I could not consistently find the heart. The sternum is box-shaped, with a projection ventrally that points caudad - it makes direct penetration to the heart more difficult than in other species. The blue-faced are hardy, and seem not to feel the needle, flying away afterward without hesitation.

While I remain after the flick to get ready for departure, Bob and Alan go after no. 1001 Laysan - only 66 more birds to band and the magic feat has been accomplished in the shortest month of the year. Considering that 3/4 of the Laysan have bands, we have to handle many birds to get 1000 unbanded ones.

The painting is showing conclusively that there is minimal intra-island movement of Laysans. Only one or two per day, out of several hundred seen, move from one area to another. In any location at least 99 per cent of the birds are of the color for that area.



28 Feb. Most of the entire morning is spent packing, washing, & in general getting ready for departure. Boat packed up & inventoried, a trunk full of birds for shipment. Finally say farewell to Kure at 1300, and midway at 1330. As we had worked long into the night I was beat, & so napped, after contacting Gene Knudsen & Char Robbins & eating with them P.M. Also saw Dr. Fisher, he has found 12 more Kure-banded *Fregata*, band #'s are as follows:

Date	#	Location
1/27/65	737-92250	S. edge, Eastern Is.
2/3/65	-93651	Center, Sand Is.
2/12/65	-92167	S. edge, Eastern
"	-92172	" "
2/14/65	-93223	SW, top, Eastern
2/16/65	-93232	S. Edge, "
2/24/65	-91742	" "
	-92071	" "
	-93526	" "
	-94184	E. edge, "
2/26/65	-93466	S. "
	-94017	S. "

It appears that birds have moved directly after being handled on Kure, at least



28 Feb (cont.) there is a tendency in that direction.

Mon.

31 March This A.M. spent fighting Navy Red-tape, but I finally get squared away for Mats Flight to Hsichan for tomorrow. After lunch Chen, Gene, & I head to Eastern for Jayson work. I spend 2 hours looking for Rene - marked Jayson, finding 11, 6 of which were caught & read as follows:

All on Eastern - Monday

#	Paint	Location
737-94463	Orange Throat	E. end of runway,
-94469	" "	Scatter Towers
-94346	Green "	500 yds E. of W. pt.
-96066	" "	<u>damaged</u> , W. of scatter tower
-96102	Orange "	S.E. end.
-96108	Red "	" "

The last 5 birds were painted luminous orange on the head. In addition, one other orange throat was seen, W. end of island.

I picked up 5 recoveries, as follows:  
Jaysons: 697-33290 Eastern, all found dead  
667-26818



1 month (cont.)

All Eaten, Found dead  
 Blackfeet 697-24017  
 637-78139  
 737-76580

A nifty Foreign Retrap of a hybrid  
 bird, Laysan - Blackfoot cross, Breast  
 white - pale, throat grey, head grey, bill intermediate  
 in color between Laysan & Blackfoot, dimensions  
 of a Blackfoot (by eye), feet grey, under  
 tail coverts white under surface of wing  
 fairly dark with light brownish patches -  
 Fws 587-58811, 2 red bands, it.

17 Seals on sand spit 'Tween End &  
 Eastern.

30 Dr. Frigate (Eastern), sexed  
 as follows:

1 Imm. (white head)  
 4 Ad. ♂, pouches inflated, displaying  
 25 Ad ♀.

There were 8 Blue-faced Boobies, 3  
 nests, 2 w/1 egg, 1 w/2 eggs - nesting  
 has just recently started

One RTTB with all flight feathers  
 moulted at least 1", fully feathered on back -  
 no down. Several other nests seen (no count)